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ORIGINAL ARTICLES.

A CONTRIBUTION TO THE STUDY OF ABDOMINAL PREGNANCY.¹

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IN spite of the amount of recent literature bearing on the subject of ectopic gestation, our knowledge of this interesting abnormality has been widened almost entirely in the direction of early tubal pregnancy; unfortunately, the same attention has not been bestowed upon its later stages, especially upon that described as secondary abdominal pregnancy, because the opportunities for studying it at the operating-table and post-mortem are limited. The consensus of opinion is now against the existence of primary abdominal gestation, and we may assume that (excluding a few doubtful cases of the ovarian variety) every ectopic pregnancy is originally tubal. The fact that even the secondary form of abdominal gestation is still denied by competent observers, and that many of the published cases have been described so inaccurately as to make them comparatively valueless, renders it important that every authentic one should be described as fully as possible. In the following case the history was so unusual as to render it quite interesting, while the opportunities for studying the anatomy of the condition were as favorable as could be secured outside of the deadhouse.

Mrs. A., thirty-eight years old, is the mother of three living children, her labors having been normal. She had never had any previous pelvic trouble. She menstruated in April, 1891, skipped the following period, and on June 26th began to have what she described as labor-pains, accompanied by profuse metrorrhagia, which continued for twelve days. The patient passed several large clots, and supposed that she had aborted. She recovered, and there was no more flow until September 22d, when she was first examined by Dr. S. Marx, a skilled obstetrician, who found that the uterus presented the ordinary condition of the pregnant organ at the beginning of the fourth month, as to size, elasticity, softening of the cervix, and the presence of Hegar's sign. The patient had morning sickness, with enlargement and tenderness of the breasts, and a few days later she affirmed

that she felt quickening. There seemed to be no reason to doubt the existence of normal pregnancy. On November 5th she was seized with severe pains in the right inguinal region, and had the same profuse flow as before, without any assignable cause. The hemorrhage continued for several days, but without the uterine contractions that had been present on the former occasion. There was no collapse or other evidence of internal bleeding. A mild attack of peritonitis, localized to the right side, followed and lasted for two weeks, the temperature seldom exceeding 100° F.

The patient made such a good recovery that she was soon able to resume her household duties, being entirely free from pain. In the meantime the supposed uterine tumor continued to enlarge regularly and symmetrically, corresponding to the normal increase in size of the pregnant organ, and the patient insisted that she could feel fetal movements, though her physician was never able (after repeated attempts) either to feel these or to hear the heart-beat. By external palpation he could detect fetal parts, though internal ballottement could not be obtained.

I saw the patient in consultation April 19th. She was in good general condition and had no pain. She still insisted that she felt life. The breasts were flabby, with retracted nipples. The abdomen was symmetrically enlarged, presenting the appearance ordinarily observed at the end of pregnancy. On making external palpation I felt a median, thin-walled sac, filled with fluid, by tapping upon which the characteristic sensation given by the small parts of a fetus was clearly appreciable. There were no intermittent contractions in the sac and auscultation was entirely negative. On making a vaginal examination I noted the fact that the cervix was hard, but thought that this might be explained by the presence of an old laceration with extensive induration. The cervix was continuous with the abdominal tumor and moved with it. It was impossible to separate the body of the uterus from the enlargement. There seemed to be no reason for passing a sound. The sac bulged posteriorly into Douglas's pouch, but the sensation was rather boggy than fluctuating. Internal ballottement could not be obtained. Nothing abnormal could be detected in either ovarian region. The examination was unaccompanied by pain or discomfort.

In spite of the somewhat peculiar history, and the impossibility of determining when conception occurred, the case seemed to be one of intra-uterine pregnancy at term. I made a probable diagnosis of hydramnios, with death of the fetus, and saw no reason for immediate interference.

I did not hear from the patient again until the middle of May, a month later, when her physician

¹ Read by title at the Fifth Annual Meeting of the Southern Surgical and Gynecological Association.

informed me that she was still *in statu quo*. As she had long passed the normal period of pregnancy, and her abdomen had continued to enlarge from the increased accumulation of fluid, he began to think that the condition must be either ovarian cyst or abdominal pregnancy. She was admitted to the hospital, and it was evident that a marked change had taken place, both locally and generally. She had become much emaciated, presenting the appearance of a patient with malignant disease. The abdomen was much distended, with general fluctuation, and the superficial veins were prominent, as in ascites accompanying malignant disease. A thorough examination was made under anesthesia. External ballottement was obtained as before, but less distinctly. Fluctuation was general, but there was still to be felt a thin-walled median sac, filling the entire abdominal cavity, displacing the stomach and liver upward, and bulging downward into Douglas's pouch, where distinct fluctuation was obtained, the wave being transmitted from the abdomen. The corpus uteri was fused with the sac, but a sound was introduced anteriorly to the depth of four inches, proving that the uterus was probably empty. Normal pregnancy was thus excluded, and the diagnosis lay between abdominal pregnancy, ovarian cystoma, or possibly malignant disease of the peritoneum with encysted ascites. The possibility of intra-uterine gestation as a complication of an abnormal condition (ovarian cyst or malignant disease) was also borne in mind, as well as the existence of a former tubal gestation with rupture, as indicated by the history. The patient was examined by several of my colleagues, who inclined to the diagnosis of multilocular ovarian cystoma.

Operation, May 25, 1892. The usual median incision was made. The peritoneum was found to be much thickened and fused with the wall of the sac, which was firmly adherent to the abdominal wall. At least a gallon of chocolate-colored fluid was evacuated. A fully developed fetus was found in the upper part of the sac, its head resting against the under surface of the liver. The fetus was removed and the cord ligated. The placenta was attached to the entire posterior surface of the uterus, filling the cul-de-sac. It was bloodless, and was readily detached without hemorrhage. The pelvic as well as the abdominal viscera were so completely shut off from the sac that it was not deemed advisable to attempt any extensive detachment of the latter for the sake of studying its relations. The following points were, however, clearly determined: The sac was symmetrical with respect to the uterus (which was moderately enlarged and lay in front of and below it), being firmly adherent to the entire posterior surface of the organ and to the posterior layers of both broad ligaments, and dipping down to the bottom of the cul-de-sac. So far as could be determined by palpation, the adnexa were not enlarged. The abdominal viscera were displaced upward, but whether extensive intestinal adhesions were present or not it was impossible to determine. The wall of the sac had a uniform thickness of an eighth of an inch, and was

lined with a cheesy, disintegrated mass, evidently the result of degenerative changes.

The sac was thoroughly irrigated and, on account of slight general oozing, was packed with iodoform-gauze, a drainage-tube being introduced to the bottom of Douglas's pouch. The edges of the sac were stitched into the abdominal wound, a large opening being left.

An examination of the fetus (which weighed six and a quarter pounds) showed that it was fully developed and only slightly macerated. The placenta corresponded with the full term of pregnancy, but was dry and bloodless.

The patient did well at first, but in a few days became septic, as the pouch behind the uterus did not drain perfectly. To correct this a counter-opening was established in the cul-de-sac, the good effect of which was soon evident. After the continuance of a high temperature and an unusually rapid pulse for a fortnight, with an exhausting septic diarrhea, convalescence was finally established, and the patient was able to be up a month after the operation, the sac having contracted to the capacity of a couple of ounces. She was discharged at her own request July 6th, as there remained only a small sinus at the lower angle of the abdominal wound. Two weeks later she was readmitted, as her mental condition was such that she could not be kept at home. It was evident that she was in a condition of well-marked melancholia, with suicidal tendencies. Locally her condition was much improved; the remains of the sac were represented by an elongated induration as large as the thumb, behind the uterus, which was reduced in size and somewhat anteverted. There was no tenderness on pressure at any point. A probe passed into the fistula at the lower angle of the abdominal wound entered to the depth of three inches.

It was impossible to keep the patient in the hospital more than a week, as she refused to take nourishment and twice attempted suicide. At the end of that time she was transferred to an insane asylum, from which she was discharged three months later, mentally sound and with the sinus entirely closed.

Several interesting questions suggest themselves in connection with this case, which may be considered most conveniently under the heads of pathology, diagnosis, and treatment.

Pathology. The condition found at the time of operation—the symmetrical disposition and perfect development of the sac, with the apparent normal condition of the uterus and adnexa—would to a superficial observer seem to prove that the case could fairly be regarded as one of primary abdominal pregnancy; but the history clearly points to an original tubal pregnancy, with intra-peritoneal rupture, and either immediate or gradual escape of the product of conception.

That a careful post-mortem examination may fail to reveal in which tube the impregnated ovum originally developed before it was expelled is shown in the two cases reported by Sutugin. My

own opinion is that the patient had in the latter part of June, 1891, an early abortion, and became impregnated in the right tube very soon after. When examined three months later, the uterus was so much enlarged as to resemble the normally pregnant organ. Two weeks later the tube ruptured (not into the broad ligament, but into the general cavity), as a tubal abortion after the second month has by Sutton been shown to be anatomically impossible, on account of the closure of the fimbriated extremity of the tube. The placenta, on being expelled into the peritoneal cavity, gravitated to the bottom of Douglas's pouch, and at once became attached to the posterior surface of the uterus and right broad ligament. The accompanying hemorrhage was, fortunately, moderate, so that the patient did not show its effects. A localized peritonitis naturally followed, the resulting adhesions shutting off the fetus, placenta, and blood-clot from the general cavity. The clot later became liquefied. In consequence of the long-standing irritation of this foreign body (and doubtless also from a low grade of peritonitis) a regular sac was formed, which enlarged symmetrically with the growth of the fetus and the increased exudation. Being fused with the uterus, it was naturally inferred that this organ was gradually enlarging as pregnancy advanced. The failure of the physician to detect either the fetal heart-beat or movements is not strange, considering the abnormal position and relations of the fetus.

When I saw the patient in April (at which time her confinement was expected) the fetus was dead, and what the woman regarded as evidences of life were doubtless the peristaltic movements of the intestines around the sac. As no pulsation was felt behind the uterus, the placenta was probably already bloodless.

An unusual feature in the subsequent course of the case was the rapid accumulation of fluid after the death of the fetus—a phenomenon directly contrary to that usually observed. It is interesting to note how little the patient's health was disturbed by her abnormal condition, and that there was an absence of symptoms pointing to other than intra-uterine gestation, from the time at which the tube ruptured until after the date of her expected confinement.

Diagnosis. This has been thoroughly discussed in a recent paper by Sutugin,¹ who reports two fatal cases with histories similar to mine and refers to others. Contrary to the positive statement of Tarnier and Budin, in the case in which he made a correct diagnosis Sutugin noted distinct intermittent contractions in the sac, which were afterward explained by the finding of muscular fibers in its wall. The

absence of such contractions in my case was regarded simply as strong negative evidence against the existence of intra-uterine pregnancy. These are, however, equally absent in cases of hydramnios with extreme flaccidity of the uterine wall.

Considerable stress has been laid upon the fact that in abdominal gestation the fetal parts can be felt with unusual distinctness through the abdominal wall. This was by no means a prominent feature in my case. In fact, the fetus was felt with far more startling clearness in a case of hydramnios in which I was called to perform celiotomy, but delivered *per vias naturales*. My experience with these puzzling cases has been similar to that of our distinguished Fellow, Dr. Engelmann, whose paper on "Abnormal Thinness of the Uterine Wall" was read at the last meeting of the Association. Tarnier and Budin attach no little importance to the absence of internal ballotement, associated with the presence of a soft, boggy mass behind the uterus, which may or may not pulsate. This was not clearly marked in this case, but still it was present, and I would not mistake it on another occasion, though the characteristic sensation imparted to the examining finger is obscured by the surrounding fluid. If the body of the uterus can be identified, of course advanced intra-uterine gestation can be positively excluded. Examination per rectum may throw a good deal of light upon the position of the uterus. If there is even a reasonable doubt that its cavity may be empty, it should be thoroughly explored with a sound, especially if the pregnancy has reached term and the fetus is alive.

It may be briefly stated, then, that in the case of a woman who presents such disturbances early in pregnancy as to justify the inference that it might have been originally tubal, and goes on to develop a thin-walled gestation-sac in which fetal parts can be felt (whether the movements and heart-beat are detected or not), and when on vaginal examination we find an elastic retro-uterine tumor we should begin to suspect that the pregnancy is not intra-uterine. As the abdominal tumor enlarges, the thinness of the sac and the irregular increase in the contained fluid, with certain pressure-symptoms of which the patient complains (pains in the back and abdomen, vesical and intestinal disturbances), will strengthen this suspicion and lead the attendant to insist upon a thorough examination under anesthesia. If the diagnosis has not been made before, it certainly will be after the expected date of confinement has long passed without visible results, though this is now too late for the diagnosis to be of any benefit to the fetus.

It is only fair to remark that the absence of nearly all of the symptoms detailed was what made the diagnosis so obscure in the case reported.

¹ Zeitschr. für Geb. u. Gyn., Bd. xxiv, Heft 1.

Treatment. It seems hardly necessary to dwell upon this point, as our modern surgical training naturally inclines us to adopt the only rational method of procedure—abdominal section. We do not need to review the disastrous results of vaginal incision to know that this is an exceedingly dangerous and unscientific method of emptying the sac. It is, as Sutugin observes, tempting to evacuate its contents in this way, but, as he found to his cost, there is imminent danger of fatal hemorrhage from laceration of the placenta; and the surgeon proceeds blindly, not knowing the exact relations of the fetus or sac. In a case of doubtful diagnosis I would prefer to make an explorative incision and find a pregnant uterus than to expose the patient to the danger of vaginal incision. It is highly important that the relation of the sac and its contents should be carefully studied. If the child has been long dead and the placenta is bloodless, of course the latter should be peeled off at once. Nature usually indicates the best way of disposing of the sac, *i. e.*, to stitch it to the edges of the abdominal wound and drain it. There is no object in trying to enucleate it if it is perfectly isolated. I believe that I made a mistake in not establishing a counter-opening in the vaginal fornix at the time of the operation. A certain amount of septic infection is to be expected; there is an unusually large cavity, containing many pockets, and one cannot err in securing free drainage.

27 EAST SIXTY-FOURTH STREET.

CLINICAL CONTRIBUTIONS TO THE SUBJECT OF BRAIN-SURGERY.

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(Concluded from page 621.)

PSYCHOPATHIC EQUIVALENT OF EPILEPSY: DEMENTIA EPILEPTICA.

Under this head recent writers have included cases not of distinctly epileptic type, but of paroxysmal, emotional, and epileptiform character, the attacks coming on sometimes with and sometimes without *aure* or other premonitory symptoms. I have operated upon three well-marked cases of this character within the past few months.

The first was in a man of thirty-one, who, July 20, 1891, was kicked in the left side of the head by a horse, and who some time later was found unconscious. He was carried into the house, and was aroused. He had no paralysis, but in three days began to act strangely and soon became wilful and almost violent. He developed erotic tendencies, and growing rapidly worse could not be kept

at home. On July 28th, he was sent to me by Dr. Krehbiel, of Yorkshire Center. At this time the patient was difficult to control and mildly maniacal. July 29th, I found a depressed area on the left side near the parietal eminence and a little anteriorly to it; yet he had absolutely no motor symptoms. At this point there was an H-shaped scar. Immediate operation was done under chloroform. Beneath the scalp I found a depression about the size of a half-dollar, around which I chiselled so as to entirely lift and remove the depressed portion. The bone was well comminuted; there was a small clot beneath the bone, but none beneath the dura. The bone was not replaced and the wound was closed without drainage. He made a rapid recovery; returned home in one week with his mind nearly clear and his disposition as it had been before the injury.

My second case was in a man of forty-five, who, when a young man, had had an extensive compound fracture of the skull, and who for a while was under the observation of the late Dr. Gray, of Utica, who advised against operation, in accordance with the practice of his day. Of late years the man has developed distinct epileptiform seizures followed by violent maniacal attacks, during which he was positively dangerous, so that his family lived in constant fear; moreover, his disposition and temper seemed to be gradually changing under this stress, and it got to be a question whether he should submit to an operation or be sent to an asylum. He was placed in my hands for operation by Dr. Putnam. This was made during October, 1891, the depressed bone being removed, adhesions separated, and a portion of the scar excised. The change in this case for the better has been most marked and most gratifying. While it is too much to say that he has not had a single seizure since the operation, they have been reduced to very mild and very rare attacks, and I believe it is now some months since he had anything that could be called a fit. In temper and disposition he is also quite his old self again.

A third case is one very recently operated on, so that I cannot report final results. A man of about thirty, had at the age of five sustained a bad compound fracture of the left side of the skull, and was so profoundly and long unconscious that for two or three days absolutely nothing was done for him by the physician in his community. He married some twelve years ago, and since his marriage has had nearly weekly attacks of faintness, but never of convulsive character, which have been followed by sullenness and manifestations of quick temper that have greatly alarmed his family. Inasmuch as there was about the head at the site of the old injury a dense and depressed scar, I ascribed his nervous symptoms to the remote effects of injury, rather than to those of his marriage. In his case I completely dissected out the scar, trephined and removed a small circular depression of bone, inserted a piece of gold foil, slipping its edges beneath those of the bone, and closing the wound as usual without drainage. Up to the moment of publication, this case has done uninterruptedly well.

LINEAR CRANIOTOMY, OR CRANIECTOMY.

My experience with this new and radical procedure has been sufficiently varied and interesting, even important, to justify individual report of each case. I will first give them in the order of their occurrence.

CASE I.—J. V., aged three and one-half years, was referred to me by Dr. Crego. As a baby he was restless and "jerky," and when nine months old had convulsions of the entire body. As he grew older he would sometimes fall in some of the attacks. These slowly assumed the conventional epileptic type, and by the time he was three years old, or in March, 1891, were perfect examples of *grand mal*. They also increased in frequency and severity. At that time he began staggering in his gait, and his left leg grew weak. Soon after it showed relative decrease in length and size. His temper became violent and uncontrollable, his epileptic seizures more and more frequent, and during the twenty-four hours previous to the operation he had between thirty and forty distinct and severe seizures. Though he was by no means an imbecile, his mental development was retarded. His skull seemed relatively small for his age. On June 21, 1891, I operated on him at the General Hospital. A long incision, one inch to the right of and parallel with the middle line, was made from the forehead to the occiput. With cutting bone-forceps I excised a strip of bone 2 cm. wide from the line of growth of hair in front nearly to the occipital protuberance behind. Then detaching the scalp for the purpose, I excised a narrow strip of bone over the fissure of Rolando on the right side down nearly to the temporal fossa. The wounds were closed without drainage. During the ensuing twenty-four hours shock was severe, and the child had several violent epileptic seizures. Since this first day he has never had another. His irascibility has subsided, his general health and intelligence have improved; he now runs, plays, acts, and talks just like other children of his age.

CASE II.—Minnie R., aged four years, was referred to me by Dr. Putnam. This was a case of congenital microcephalus and imbecility. The parents were healthy, and the family history was good, the previous children being sound. This girl had scarcely ever spoken a word, and manifested no more intelligence than an infant of three months. Her fontanels closed very early. She leads a vegetable sort of existence—without disturbance of function. Operation here seemed much less hopeful than in the previous case; it was, nevertheless, undertaken July 13, 1891. An incision was made 3 cm. to the left of the middle line, from 4 cm. above the left superciliary region to the occipital protuberance. A strip of bone was excised much nearer to the middle line. After removing it the scalp was pressed away on the left side and a strip excised over the Rolandic fissure. I then made an incision over the right Rolandic fissure, and excised another strip of greater length, the three lines of defect having a common meeting-place. The central grooves were cut with forceps, the

lateral grooves with a chisel. There was no great hemorrhage, and the wounds were closed without any provision for drainage. The child nearly collapsed after the operation, and for two days required constant attention. The after-results in this case have been practically *nil*. There has seemed to be a perceptible improvement in intelligence, and the child has appeared a little more alive to what is going on about her, and this is about all that can be said.

CASE III.—W. K., aged eighteen years, was referred to me by Dr. Crego. From an early age the patient's mental development has been very disappointing. He is physically large and well developed, but mentally shows scarcely more intelligence than a child of two or three years. At the age of about five he first showed epileptic manifestations. His seizures were then few and far between. They gradually increased in frequency, until now he has several in one day, but may possibly go a few days without any. His temper is usually good, but at times he is excessively wilful. The upper portion of his cranium is relatively small, though not conspicuously so. The muscles of his right side are somewhat atrophied. It seems that his epileptic fits have been somewhat more violent on the right side than on the left. His personal habits are good, as is also his family history. Dr. Crego and myself both thought that an extensive cranial opening might give relief, and the experiment was proposed and accepted by the father. Operation was done October 20, 1891. A long incision was made to left of the middle line. When I endeavored to make a longitudinal division of the skull, commencing with a common amputating saw, I found that the bone was very thick. I then applied a trephine over the motor area, and, through the opening thus made, with chisel and gouge-forceps removed a portion of bone, some 5 cm. in diameter, and in shape like a spherical triangle. Through a small opening in the dura I found that there were no adhesions, but that the arachnoid and pia were succulent and edematous. I started to make a longitudinal excision of bone, but finding the same to be 1 cm. thick, desisted from this attempt, and tried to make simply a large relief-opening. The wound was closed with catgut, and an ice-bag applied outside the dressing. At 6 P.M. the boy was somewhat restless, and had a fit. This condition became more marked, and by midnight, in spite of considerable morphine and other sedatives, he was convulsively restless and violent, and required both a strait-jacket and chloroform. At 4 A.M. he died of exhaustion.

CASE IV.—J. M., aged fifteen years, was healthy until he was three years old. Then his nurse used to frighten him, and he grew to be very nervous and timid. He soon began having fits every night, until he was thirteen years old, when they occurred in the daytime also. Shortly after this he was having from thirty to forty fits every day. During one of these he fell and broke his elbow, which is now partially ankylosed. He also cut his forehead to the bone. For the last two years he has been lying most of the time helpless in bed, and has had to be fed. His symptoms, mental and

convulsive, seemed to occur in cycles of about three weeks each. During the first week of the three he would be noisy, in the second he would be weeping and wailing, and during the third apathetic and almost unconscious. He rarely spoke. All the children of this family were rhachitic. November 2, 1891, the boy was brought to my clinic in this third stage, and it seemed impossible to arouse him. He took mechanically most of what was put into his mouth. His bed was constantly soiled. His arms, and sometimes his legs, were nearly always in the athetoid condition, and any little disturbance would bring on a mild seizure, during which his arms were drawn up over his head. There were no scars over his motor areas. November 7, 1891, the operation was carried out at clinic. A long incision was made to the left of the middle line, and after a first opening of the trephine a long strip of bone, 1 cm. wide and 13 cm. long, was removed just to the left of the longitudinal sinus. The operation had to be discontinued because of collapse. The patient stopped breathing, nearly died on the table, and was revived with great difficulty. The wound was closed as rapidly as possible. He seemed better the same evening, but next day the athetosis continued; he became uneasy, and died, twenty-six hours after the operation, of shock.

CASE V.—S. P., aged nine years. This patient is of Russian-Jewish parentage, his father being an educated man, and the other children healthy. He presents a defective skull-development, especially over the left frontal lobe; is imbecile and epileptic; has seizures coming on about every five days. His forehead slopes backward so as to give him somewhat the appearance of an Aztec child. Mentally he is an imbecile, mutters half a dozen words, staggers about the room, but in disposition is good-natured and even confiding. He was operated upon November 14, 1891, at my clinic. In this instance I varied the ordinary procedure in that I laid up a V-shaped frontal flap, its apex reaching nearly to the vertex of the skull, its extremities extending nearly to the external angular processes. Then a small trephine was applied on each side of the middle line; the opening thus made was connected across the longitudinal sinus, and then two strips of bone were excised in a direction parallel to the scalp-incisions, by which considerable spring was given to the frontal bone and the fragments of others attached to it. The operation proceeded without incident, and the first dressing was not made until eight days later, when perfect union was found. The immediate effects in this case were not very pronounced; the seizures, however, became less frequent and less severe, and when the boy left the hospital a few weeks later he had lost his staggering gait, and his various actions and attempted speech showed much more fixedness of purpose than was previously the case. But at the end of a year the results in his case have to me been astounding. He has had no fit for three months, and within a week or two was again exhibited at my clinic. He came up to me and publicly asked in clear and distinct tones whether he could go to school. I held some conversation with him before my class, in order to

show that he was capable of rational thought and rational and even accurate conversation. In addition to this he has developed physically, and his face now has a really intelligent expression, whereas a year ago it was expressionless.

CASE VI.—C. S., aged twelve years, of Warren, Pa., was sent to me by Dr. Baker. This child was also an imbecile, speaking but few words, being at times irascible, and having at times frequent epileptic seizures. There was partial paresis of the left arm, although she used it more or less. In her case there was great asymmetry, there being a great depression over the right side. She was operated on the same day as the previous case at a special clinic given for these two cases, and a strip of bone about 1 cm. wide was excised to the right of the middle line, extending well backward and forward into the frontal bone. The dura was not opened. At the first dressing, one week later, perfect union of the wound was found, and a light dressing only was applied. A few hours later she got restless and tore this off, and then picked the wound open so that it gaped for its whole distance. It was immediately re-dressed after disinfection with hydrogen dioxide, but healed the second time by the slower process of granulation. During the few weeks of her stay in the hospital she improved a little. A letter from Dr. Baker, dated October 25, 1892, nearly a year later, states that "she is no better now than she was before operation. For the first three months after operation there was a marked lessening in the number of paroxysms, but for the last three months the convulsions have been both severe and frequent, she having several daily. She is in much the same condition mentally that she was before operation."

From the foregoing reports it will be seen that I have had six cases of this general character, of which two were promptly fatal, two have been practically unaltered, and two have been brilliantly successful beyond all expectation. Of the two fatal cases I can only say that they belong to a class of patients about whom in general we feel that death is vastly preferable to such a life, and while I think that the second case might have been benefited had he survived the shock, I regard the first as having been essentially and absolutely hopeless in every respect. Save in a purely personal sense, I have no regret for the operation, which was freely assented to by the parents. In fact, in every one of these cases the parents have been made fully aware of the difficulties and dangers, and have in every instance said that they would rather lose their children than see them live in the condition in which they were at the time of the operation.

The two cases in which no result has been noted I suppose must be regarded as belonging to the class of cerebral atrophies that have been stigmatized by Dr. Starr as essentially hopeless. In both of these cases the principal regret of the parents is that their children survived the operative ordeal.

Of the two successful cases any man might well feel proud as having contributed to such marvellous changes. They are of themselves sufficient reward and justification for a score of unsuccessful cases, and lend an element of hope in similar instances of which the profession should not be deprived.

CASE VII.—Since writing the foregoing I have operated upon an infant of fourteen months who was born during a natural labor, of a healthy mother who had borne other healthy children. The child shows no ordinary signs of rickets, but its fontanels closed very early, and it shows scarcely any more sign of intelligence than does a vegetable. It seems to recognize the difference between light and darkness, to have the sense of hearing reasonably acute, and is physically in good condition. Her principal evidence of life and activity is her constant crying at night, so that her mother told me that she has had practically no rest since the child was born. In this instance the father said to me, with tears in his eyes: "Do all you can, and be sure to do what you think is enough, without stinting operation; for I had rather bring the child away from the hospital in a coffin than in this condition." Operation was made the same way as in Case V, but the child, who stood the operation well, collapsed, and died suddenly the same evening.

Without prolonging this paper to too great an extent, I desire before closing to invite attention to a few conclusions, the results of my deliberate convictions and reflections upon this kind of work.

1st. We have not yet learned the possible limits of brain-surgery, so-called, or the possible limits to which we may with reasonable safety interfere with the functions of the brain or its component parts. Final knowledge in this respect will come probably rather through clinical experience than through experimental investigation.

2d. I have had a number of brain-cases whose history shows that at the time of reception of injury the symptoms were so serious and severe as to lead the medical attendants to consider the case hopeless, so that practically nothing was done. I wish to say all I can to condemn this apathetic course, and to urge that the most desperate case be attended to at once, with the same attention to detail as though it were quite hopeful in its outlook.

3d. In many of my own cases, and my experience is like that of many others, the mental or other disturbance that has finally led to operation has been allowed to run along, often for years and years, and patients have been brought to the surgeon only as a last resort. This course is as unwise in these cases as when we deal with malignant disease, and the profession generally should learn that the prognosis would be very much more favorable in such cases were they operated upon when these disturbances first make their appearance.

4th. Personal experience has convinced me that when I have erred in operating for epilepsy or psychic disturbance, it has been rather on the side of doing too little than too much. For instance, in one of the cases alluded to under the caption Epilepsy, in which no improvement was manifested, I am now sorry that I did not take out so much of the arm-center as to produce at least temporary paralysis of the arm. In other words, I have never regretted doing too much, but in several cases have regretted not doing more than was done.

5th. I wish again to insist upon the necessity of long-continued medicinal and dietetic treatment after these cases have passed out of the hands of the surgeon.

THE UNCERTAINTY OF DETECTING THE BACILLUS OF TYPHOID FEVER IN SUSPICIOUS DRINKING-WATER.

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THERE is no task within the scope of sanitary work that is ordinarily beset with more difficulty and uncertainty than the tracing of an outbreak of typhoid fever to its exact source. In a number of well-known instances, however, a direct causal connection has been proved to exist between polluted water-supplies and these outbreaks. In these cases the evidence in favor of this opinion was sufficient to leave no room for doubt; but this is by no means the case with the great majority of outbreaks of this disease.

The appearance of typhoid fever in a community is oftentimes inexplicable, and in the course of investigation tending to discover its cause, it is customary for the water-supply to receive a relatively large proportion of attention, and when the disease appears in an epidemic form suspicion that is directed to the water-supply is not always without foundation; particularly is this the case in communities that are supplied with water from open streams that may receive in their course the sewage from human habitations.

Those elements that are essential to the life of the community and that are used in common by all individuals in the community are air and water.

On reliable grounds the air is discarded as a means of disseminating this disease, and it is not improbable that it is through the use of polluted waters that typhoid fever most frequently appears in an epidemic form. In order that this may be the case, it is essential that the water should have been polluted with the dejecta of a typhoid-fever patient, containing the specific germ of the disease; but, though this is true, it is exceedingly rare for the bacillus of typhoid fever to be detected in suspected water, and, as a rule, in the hands of reliable

analysts the results of these examinations are negative.

Though the literature on the subject is fairly rich in recorded bacteriological analyses in which the typhoid-fever organism is claimed to have been found in the water, there are, nevertheless, good grounds for doubt as to the accuracy of many of these assertions.

In the first place, suspicion is rarely or never directed to the water-supply until the epidemic is in full progress or on the wane, and as the period of incubation of typhoid fever appears to vary between fourteen and twenty-one days, it is plain that the organisms that caused the epidemic, assuming that they had been present in the water, may have disappeared from it by the time of examination.

If the pollution were continuous, which is rarely or never the case, one could reasonably expect to find the organisms present in any sample of the water that might be subjected to examination, but in most instances it is only temporary, and a sufficient interval usually elapses, therefore, between the time at which the typhoid-fever bacilli were present in the water, *i. e.*, the time when the infection occurred, and the appearance of the epidemic, for the water to have resumed its normal condition.

Another ground upon which some of the statements, to which reference has been made, may be doubted, is the exceptional difficulty, and at times, indeed, the impossibility of identifying this organism when present with other closely allied bacilli outside of the human body. The reason for this is that there is a group of other organisms, frequently present in the soil and water, the morphological and cultural peculiarities of which are so like those of the typhoid-fever bacillus obtained from the diseased human body, that their absolute differentiation is always a matter requiring extreme care.

One such organism recently appeared in the course of investigations by the writer in connection with the water-supply of a locality affected with typhoid fever, and had conclusions been drawn before it had been under observation for a relatively long time, they would have been false. The morphology of this organism and its cultural peculiarities were in many respects identical with those of the typhoid-bacillus. Its growth on potato was irregular, sometimes being visible, again invisible; it did not alter the color of blue litmus milk, nor did it cause fermentation of glucose; and it was actively motile. After one, two, or three days its colonies upon gelatin could not be distinguished from those of the bacillus of typhoid fever, so that at the end of this time it looked as if we had found the typhoid-bacillus in drinking-water.

At the end of a week, however, in looking over these cultures again, the growth on gelatin presented

a somewhat different aspect, and the colonies on the plates seemed to be sunken and resting in very shallow depressions. Upon closer inspection it was found that a sort of liquefaction had taken place; this was so limited in extent as hardly to be recognizable, unless efforts were made to take up a portion of one of the colonies upon a needle; it could then be seen that instead of being fixed upon the gelatin, as is the case with the non-liquefying typhoid-organism, the colonies lay loosely in shallow semi-fluid pits. On repeating the experiment it was noticed that this organism when planted upon gelatin and kept at a temperature sufficiently high to admit of its growth, but not high enough to melt the gelatin, caused a peculiar form of liquefaction that did not appear before the sixth or seventh day. For this reason, in view of the features in which it is similar to the bacillus of typhoid fever, one might readily mistake this organism for it, if the observation is continued for only a period of three or four days.

The organism occasionally present in water that is most commonly confounded with the bacillus of typhoid fever, is the common bacillus of the colon—the bacterium coli commune—the presence of which in drinking-water is of almost as much value in pointing to pollution by human evacuations as are the indications offered by an excessive amount of chlorine as determined by chemical means. But this organism is now known to differ in certain essential respects from the bacillus of typhoid fever, so that its differentiation is a matter of less difficulty than was formerly the case.

There are few pathogenic organisms that are so simulated in many important respects by certain ordinary saprophytes as is the bacillus of typhoid fever. Its morphology is inconstant, and its growth upon special culture-media is now known to be less constant than was at one time supposed. Its growth on potato, originally described as being characterized by a prolific multiplication that was not visible to the naked eye, was believed to be diagnostic, but we now know that in this respect also it varies: at times growing invisibly, while again its development can be readily seen. Its growth in media containing soluble pigments; its development upon media made from the expressed juice of the potato; and its behavior toward media containing carbolic acid, have all in turn failed as absolute diagnostic tests for this organism. Unlike the great majority of other pathogenic bacteria, it is rare that pathological conditions analogous to those seen in the disease from which it is obtained can be produced, and in only a limited number of instances have efforts in this direction proved successful, and then only by special methods of inoculation.

For the reasons given, the bacteriologist who is

called upon to examine suspicious drinking-water should be familiar with all the peculiarities and variations of the true typhoid-bacillus as obtained directly from the spleen of a subject dead of this disease, and in the case of suspicious organisms their peculiarities should be constantly compared with a culture of the true typhoid-bacillus grown upon exactly the same medium and under similar circumstances. If one experiments with a pure culture of the bacillus of typhoid fever it will be found that within certain limits its biological characteristics undergo variations. Its morphology is most irregular: it will sometimes appear as short oval rods, while again it may be seen growing as much longer threads that will often extend across from $\frac{1}{4}$ to $\frac{1}{2}$ the field of the microscope; frequently both forms will appear in the same culture. Between these extremes of length all variations may be detected. When stained with the ordinary aniline dyes the cells often take up the staining in a peculiar and irregular way. They will at times appear to be colored at only one end or in the middle, the balance of the cell remaining unstained; again, irregular, clear, unstained points will be distributed through the protoplasm of the cell or may lie along its lateral margin and cause the stained cell to appear as if bits had been sharply punched out of it. A cell may contain one or several of these unstained areas. They are probably due to retraction of the protoplasm from the cell-envelope.

When stained by the special method for the demonstration of flagella, this organism is seen to be provided with delicate hair-like appendages, one or more times as long as the body of the cell itself, which radiate in all directions from the periphery of the cell. They are the locomotor apparatus of the organism and it is by their lashing movements that the organism possesses its high degree of motility when suspended in fluids.

The bacillus of typhoid fever does not form spores, though for a time after its discovery the colorless portions just referred to, and especially when they occupied one end of the cell, were mistaken for spores. When grown upon nutrient gelatin no liquefaction occurs; it does not develop very rapidly, and when the colonies are small and deep down in the gelatin they present but little or nothing that is characteristic. When on the surface of the gelatin, however, and of about 1 mm. in diameter, certain peculiarities of structure appear that aid considerably in the identification of the organism. To the naked eye the colonies now appear as slightly irregular, pale or bluish-white points that are somewhat elevated above the surface of the medium. Its borders are wavy and it is a little denser at the center than at the periphery. When slightly magnified it is

seen to be irregularly marked by ridges and furrows. No better description of the colony at this stage can be given than that its ridges and furrows give to it an appearance very similar to that presented by the irregularities seen upon *bas-relief* maps employed for representing undulations upon the earth's surface. When planted upon sterilized potato and kept at a temperature of 37° C. the growth of this organism is most commonly invisible to the naked eye, and a multiplication of the bacilli planted can only be made out by microscopic examination of scrapings from the surface of the potato. In a fair number of cases, however, the growth is visible and can easily be seen. To what these differences are due it is impossible to say, but most probably they arise from differences in the potatoes employed.

When grown in milk there is no coagulation and no apparent change, though the development may be luxuriant. If blue litmus tincture is added to the milk the color is either not at all changed or else there is the faintest suggestion of pink, indicating a very limited production of acid. Of equal importance for the differentiation of this organism from others that simulate it is its behavior when grown in media to which glucose has been added; under no condition does it cause fermentation of glucose with liberation of gas, a peculiarity that is diametrically opposed to that of certain other organisms with which it might be confounded, particularly the bacterium *coli commune*, that in most respects is like the typhoid-bacillus and is probably the organism most often mistaken for it.

When grown in Dunham's peptone solution the bacillus of typhoid fever does not form indol, and the rose color, characteristic of this body, does not appear after the addition of either concentrated sulphuric acid alone, or of the acid and sodium nitrite.

The production of carbonic acid as a product of growth of this organism, though not definitely fixed in amount for constant conditions, has been noticed to be less than the amount produced by some of the organisms similar to it.

The common experience of those into whose hands it has fallen to differentiate bacteria that are similar to the typhoid-bacillus from the true typhoid bacillus is that it is a laborious task and one requiring the most conscientious work. From what has been said this will readily be understood, and, therefore, no single peculiarity should be taken alone as diagnostic, and unless the organism under consideration fulfils all the requirements noted it should be grouped in the class of so-called pseudo-typhoid bacilli—i. e., that group of organisms that simulate the typhoid-bacillus, but which are not identical with it.

EARLY DIAGNOSIS ESSENTIAL FOR THE CURE OF UTERINE CANCER.

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IN THE MEDICAL NEWS of December 5, 1891, I published an article on the radical treatment of uterine carcinoma. In it I contended that, for this deadly disease, the only trustworthy operation is the removal of the womb, and that, both in its immediate and in its remote results, it is an extremely satisfactory operation. Statistics were adduced to show the very low rate of mortality from this operation when performed in appropriate cases *per vaginam*, and not through an abdominal incision. These statistics also warranted the assertion that the remote or permanent success of this operation far exceeded that of all operations undertaken for carcinomata in all other parts of the body, the number of cures being surprisingly large. This success was attributed to the anatomical fact that the lips, breast, penis, and rectum—the favorite sites of cancer—are integral parts and parcels of the body; while the womb is to the body only an appendage. It is an organ not integral, but complemental—one which, as it were, is merely hung in the pelvis, and that by ligamentous bands of a mongrel tissue not homologous with that of the womb. The technique of the various operations for vaginal hysterectomy was also described, but the preference was given to that by the progressive catgut ligature.

A year's additional experience with this radical treatment of carcinoma of the uterus, so far from changing or even modifying the foregoing views, has served still further to confirm them, and I unhesitatingly urge this operation in every suitable case. But what is a suitable case of uterine cancer? It is, firstly, one in which the womb is removable; and, secondly, one in which an operation promises well, both in its immediate and in its remote results. A suitable case, therefore, is one in which the womb is not fixed, the vagina is free from all carcinomatous nodules, and the broad ligaments show no signs of infiltration. In other words, a suitable case is one in which the neoplasm is limited wholly to the womb. In such a typical case the operation is easy, safe, and curative.

Unfortunately, however, in the great proportion of cases that present themselves for the first time to the surgeon, the disease has become too far advanced. The growth has probably crept up the cervix and, penetrating its substance, has invaded the bladder or the vagina. It has travelled along the broad ligaments and deposited its germs outside of the womb. By this time the womb will be more or less fixed, and the bladder and the vagina firmly sealed to it. The surgeon, therefore, has either to

reject the case or he has to perform a dangerous operation, which can be only palliative, and not curative. The gist, then, of a successful treatment lies in an early recognition of the cancer.

In a very large proportion of the cases the disease begins in the vaginal portion of the cervix. It does so because this part of the womb bears the brunt of the injuries sustained in coition and in parturition. The cancerous nodule, or ulcer, starts usually in the notch of a torn cervix, and it is, therefore, most commonly found in women who have borne children. I have not, indeed, to my recollection ever seen but a single case of cervical cancer in a virgin, and not more than three cases in sterile women. One of these three cases, although apparently an exception to the rule, singularly enough confirmed it. The lady had a submucous fibroid, which was slowly emerging from its uterine bed. After suffering much pain and losing much blood for several months she decided to call me in. I found the os uteri dilated to the size of a silver dollar, and crowning the protruding fibroid like a fetal head. The tumor was seized, wrenched from its bed, and delivered, but not without difficulty, as it was larger than the os uteri. A few months later carcinoma of the cervix set in.

The ordinary symptoms of carcinoma in the usual order of their appearance are: Pelvic pain, ichorous leucorrhea, hemorrhages, fetid discharges, and general cachexia. But, while these symptoms are characteristic, some of them may be absent, or their sequence may be variable. Thus, pain may not be present, or the malignant ulcer may first reveal itself by a hemorrhage; sometimes, indeed, by a general cachexia, which by rights should be the final symptom.

The symptoms on which the majority of physicians lay too much stress, and on which the laity wholly rely, are lancinating pains and fetid discharges. Now, very unfortunately for an early diagnosis, these symptoms rarely assert themselves until the disease has advanced too far for its radical treatment. The symptom of pain, which is so widely deemed essential to malignancy, is a very delusive one for the physician to lean upon. We all know how insensible the cervix uteri is to the knife and to the actual cautery. So, in the great majority of cases of cervical cancer, pain, as an exacting symptom, is absent in the earlier stages, and it claims attention only when the disease has attacked the sensitive uterine adnexa, or the still more sensitive uterine cavity. In some cases in which the endometrium has been invaded, the suffering is often excruciating, and I shall never forget the agony of one of my patients. For some weeks before her death she had to take daily by the mouth from 20 to 35 grains of morphine.

On the other hand, I have known women to die from the ravages of this cruel disease, who complained of nothing more than the ordinary female backache—that misleading canonical sacral pain from which every woman at some period of her life suffers. Hence, pain, especially of the lancinating variety, is not to be looked for as an invariable accompaniment of this disease. Most certainly it should not be considered pathognomonic of it.

Nor can the vaginal discharges be deemed more trustworthy evidences of malignancy. At the beginning, and often long after the onset of the disease, the discharges are not only not fetid, but they present no characteristic features whereby they can be distinguished from any ordinary leucorrhoea. Later on, they usually become tinged with blood, like meat-washings; but even then they may be wholly free from any putrid odor. In point of fact, in its early stages there are no such tell-tale symptoms as would arrest the attention of the woman and arouse her alarm.

A digital examination is the only trustworthy way of arriving at a correct diagnosis, and this should never be neglected in any case of painful coition, stubborn pelvic pain, free leucorrhoea, and especially of irregular uterine hemorrhages. In point of time a persistent leucorrhoeal discharge precedes every other visible symptom; but this is a disorder so common to the sex that it is generally disregarded. Irregular hemorrhages are practically the first appreciable manifestations of the disease, and they should always be looked upon with suspicion, especially when the woman is over thirty-five, and has borne children—I repeat it, *when she has borne children*—because, as previously stated, a cervical tear is the most common cause of malignant disease of the cervix.

A show of blood, however slight, following sexual intercourse should awaken suspicion, for it ought to convey the meaning that the male organ hits an open sore. Increased monthly flows, or the appearance of inter-menstrual shows, or blood-dribbling after an unusual exertion at the climacteric period, are warnings of grave import. But, perhaps, the most significant danger-signal of all is a counterfeited renewal of menstruation after its cessation. For instance: A woman at the age of forty-five ceases to menstruate; yet two years later she begins to have vaginal hemorrhages. Now, instead of being alarmed at these untimely shows of blood, the woman usually accepts them as a return of her monthly periods, and joyfully interprets them as meaning her rejuvenescence. Here, let me in one word say, that the traditional belief in climacteric hemorrhages, as such, is a delusion and a snare. The climacteric is not an entity that of itself begets the hemorrhages attending the change of life. But the

carcinomata, the polypi, the fibroid tumors, the uterine vegetations, which start into activity in and about that period of life—these are the factors—these the entities. Irregular hemorrhages, then, at or after the menopause, are truly the red lights of warning to the alert physician, who will at once urge a vaginal examination, both for his own credit and for the sake of his patient.

In its earliest stages a carcinoma of the cervix usually appears as a hard nodule under the mucous coat of a torn cervix. Soon this breaks through its envelop and forms an open and indolent ulcer. Sometimes the exuberant vegetations on this sore cannot be told from the cockscomb granulations of a bad cervical tear, or indeed from those of a syphilitic ulcer, and the aid of the microscope may be needed. But usually the diagnosis is an easy one. The sharply defined rim of the crater-like sore, the friable vegetations that bleed on the slightest touch, and the dense hardness of the surrounding cervical tissue, tell the sad tale with unerring accuracy.

Whilst in the very large majority of cases, malignant disease of the cervix is the rule, yet malignant disease of the endometrium or of the body of the womb occasionally happens. It will then be met with under the form of sarcoma, of papilloma, or of epithelioma. Senile endometritis tends to this form of malignant degeneration, and it should, therefore, be combated at the outset. This is best done by the use of the sharp curette and by the subsequent packing of the uterine cavity with iodoform-gauze. Old maids and sterile wives are usually the victims. But fruitful women who have ceased to bear are not wholly exempt from supra-cervical carcinomata of the womb. In my private hospital, about a year ago, I successfully removed such diseased wombs from two ladies. One had borne three children and was fifty years old. The other one had given birth to ten children and had reached the age of sixty-three. In these two typical cases, neither a digital nor a speculum examination revealed any evidence of malignant disease. The cervix appeared perfectly healthy, both to the finger and to the eye. But in each one an obstinate leucorrhoea had prevailed for a long time, followed later on by irregular blood-dribblings that lasted for several days at a time. The diagnosis was made by the curette, which removed bodies like boiled tapioca. This was confirmed by the microscope, which revealed in the one the cells of papillary carcinoma, in the other those of epithelioma. In neither of these cases has the disease returned.

These cases of cancer of the body of the womb are more successfully dealt with than those in which the ulcer begins on the cervix. The disease is less likely to return, for two reasons: Firstly, because the ulcer or the malignant growth, from its position,

more slowly invades adjacent structures, and is, therefore, more likely to be limited to uterine tissue. Secondly, because the woman, in these cases, has usually passed the climacteric, and the disease then is less liable to return after extirpation of the womb, than during the period of menstrual life, when the womb is more vascular and more succulent.

To sum up: In order to make an early diagnosis of uterine carcinoma, the physician, wholly ignoring the climacteric as an entity, must insist upon a digital and a speculum examination whenever his patient complains of any untoward or any unwonted pelvic symptom. More is learned by the finger than by the speculum, for in these cases one can feel more than one can see. Besides this, the speculum is liable to break off crumbling growths and to set up a troublesome hemorrhage. If the cervix is sound, and the discharges, whether bloody or leucorrhœal, come from the uterine cavity, the curette must be used as an aid to the diagnosis. In all cases of doubt the microscope will render efficient help. When the diagnosis has been made, and that early enough to find the growth limited to the womb, there remains to the physician but one more duty—he must urge the immediate removal of the womb.

SURGICAL TREATMENT OF LABOR DELAYED BY RIGIDITY OF THE OS UTERI.

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THERE is no more trying complication of labor for patient and for physician than persistent rigidity of the os uteri. Usual in very young or old primiparæ, it is occasionally encountered in multiparæ. In addition to prolonged labor, inducing exhaustion and greatly depressing the patient, this condition has positive and serious dangers, such as hemorrhage from extensive laceration, necrosis of the tissues long pressed upon, septic infection; and fetal death is also often a result of this complication.

The causes of this condition are pathologic processes in the cervix that have altered its normal consistence. Occasionally a rigid state seems congenital. Nature unassisted treats these cases in her usual conservative manner, or, in desperate conditions, by removal of the offending tissue. Usually after long-continued pressure by the bag of waters, the tissues yield gradually and the child is born, resulting in a moderate laceration of the cervix. The results of continued pressure by the fetal head will depend largely upon the presence or absence of the amniotic liquid; if the membranes have not ruptured, no serious damage of the uterine tissues can result. The amniotic liquid serves as an elastic pro-

jector of these tissues, and exerts an equable pressure in dilatation. If, however, the membranes have ruptured and the head presses immediately against the cervix, it will sooner or later interfere with the circulation of the part, and stasis, edema, and gradual necrosis will result.

In extreme cases nature removes the offending portion almost entire; thus, in a remarkable case reported by Keller (*Transactions of the Philadelphia Pathological Society*, 1857, vol. i, p. 17), several hours after labor a tumor was found protruding from the vulva; a ligature was applied around its base, and the tumor came away five days afterward. On examination this proved to be the healthy neck of the uterus which had been carried down by the child's head. The patient recovered and subsequently bore a living child in normal labor.

Cases in which the entire circle of the os uteri is thrown off during labor are not exceedingly rare; thus, Kennedy, of the Rotunda Hospital, reports (*British Medical Journal*, Aug. 17, 1872) the case of a multipara from whom was expelled a complete circular ring, three-eighths of an inch thick by one inch in breadth, which proved to be the detached os uteri. The labor proceeded rapidly, there was little hemorrhage, and the patient made a good recovery. The lochial discharge persisted longer than usual, and was somewhat offensive. Similar cases have been reported by others.

An immediate danger in these cases is that of hemorrhage; serious laceration of the cervix can scarcely occur without a profuse hemorrhage that may become fatal. It is not unusual for the cervix to be torn upon its left side, but Remy reports a case (*Archives de Tocologie*, October, 1887) in which almost fatal hemorrhage followed such a laceration. The following case illustrates an unusual form of hemorrhage in these cases:

A primipara of good general development and normal pelvis was in the first stage of what promised to be a normal labor; the cervix was rigid, but not sufficiently so to excite the apprehension of the attending physician. Labor pains persisted during the night; then, early in the morning, a sudden, profuse, arterial hemorrhage occurred. Making an examination, the attending physician could find no placenta previa; the os was but partly dilated; the membranes had but just ruptured; the bleeding seemed to come from the cervix, although no considerable laceration existed. A tampon wet in vinegar was at once applied, when the hemorrhage ceased. Seeing the patient shortly afterward in consultation, I removed the tampon and found that upon one side of the cervix the tissues had begun to tear, not from the os toward the body, but had separated upon the external surface of the cervix in an irregular, jagged tear; this had opened a branch of the uterine artery. The patient was anesthetized, the birth-canal thoroughly disinfected, and six or

eight incisions of from one-quarter to one-half an inch were made in the cervix around the lumen of the os; labor then proceeded, terminating normally. Mother and child made an uninterrupted recovery.

Traumatic hemorrhage following rigidity of the cervix may be developed during the puerperal period; thus, Barnes, in his *System of Obstetric Medicine*, edition 1885, p. 577, narrates a case in which profuse hemorrhage occurred while the os was undilated and the cervix rigid. Labor was induced, the os being dilated by the hand, and living twins were delivered. On the fifth day after labor the patient died from profuse hemorrhage. Rupture of the uterus was not present, but the long-continued pressure of the hand had produced contusion and necrosis of the os uteri; a portion of the cervix had sloughed off, leaving an ulcer which had opened the uterine artery.

Children perishing after a labor of this kind, present conditions of visceral hemorrhage, blood being extravasated in the parenchyma of all the large organs of the body.

The treatment of rigidity of the cervix consists first in an effort to secure those conditions that further dilatation. Thus the bowels should be thoroughly unloaded, if necessary by several copious, warm injections. For this purpose the following is efficient: hot castile soap-suds, one quart; castor oil, one ounce; to be thoroughly mixed; add to this one teaspoonful of spirits of turpentine thoroughly beaten up with the yolk of a raw egg; the whole to be thoroughly mixed and injected at a temperature not lower than 100°, the patient lying upon her left side. The use of a fountain syringe is to be preferred in giving this injection. If necessary, the patient should be catheterized. Further, the physician should ascertain that the presentation is favorable to dilatation; otherwise, version by external manipulation may be indicated, or the patient may be placed in a posture suitable to favor dilatation.

So long as the membranes are unruptured and the parts remain in their natural condition of temperature and moisture, the patient's nervous sufferings should be lessened as much as possible. Chloral hydrate may be given to advantage in doses of twenty grains by the mouth, or injected, dissolved in warm water and milk, into the rectum. This may be repeated in an hour, if desired. Antipyrin or phenacetin in small doses, one or two grains each, every two or three hours, is of assistance. When the patient is thoroughly tired, the membranes unruptured, the parts neither hot nor swollen, a hypodermic injection of $\frac{1}{8}$ of a grain of morphine and $\frac{1}{16}$ of a grain of atropine will usually secure a brief period of sleep, and do much to lessen the subsequent suffering of the patient. The patient's strength should be supported by the ad-

ministration of small quantities of easily-digested food. A few ounces of broth, milk, or cocoa, taken as hot as can be borne, will be found useful.

Local applications are of doubtful value; the old practice of smearing the cervix with belladonna ointment is scarcely efficient in comparison with other methods of treatment. Occasionally a rectal suppository of opium, belladonna, and iodoform, when the odor of the last is tolerated, is of considerable advantage. Hot vaginal douches containing boric acid, or creolin $\frac{1}{2}$ per cent., given very gently, are of advantage. They may be repeated hourly, and have in my hands served a useful purpose.

While this period of labor calls for the exercise of great patience on the part of the physician and his patient, it likewise demands faithful observation of the conditions present. The heart-sounds of the fetus should be carefully listened for, so that any weakness may be promptly detected. The condition of the mother's parts, the rigidity of the uterus, and the development of a contraction-ring, are matters of which the physician should be cognizant. So soon as a reasonable time has elapsed without progressive dilatation, and in the failure of the means already described to promote this end, manual dilatation or incision of the cervix should be performed. For the first, the patient may be advantageously brought partly under the influence of chloroform. The vagina having been douched with creolin solution, and the hand of the physician having been thoroughly cleansed and soaked in the same solution, the hand is folded into the shape of a cone and the fingers are gently inserted within the os; by cautiously endeavoring to open the hand and gently moving the fingers around the circle of the os, it is possible to considerably stretch these tissues. Such efforts should be intermittent, preferably occurring with the uterine pains, and should not be continued until the tissues begin to be less moist and of higher temperature than normal. The rupture of the membranes in these cases requires careful discernment on the part of the physician; preferably, they should be left to rupture spontaneously, and the physician must be very sure that labor can be safely terminated within a comparatively short time before he thus brings the head directly to press upon the tissues of the os and cervix.

But when the cervix still remains undilated and rigid, and the condition has persisted until the patient's strength is failing, there can be no question of the propriety, under antiseptic precautions, of making multiple incisions into the cervix. While this procedure has met with more favor upon the continent of Europe than elsewhere, it shares with other surgical procedures the advantages of simplicity, directness, and prompt relief afforded by it;

but without the faithful employment of antiseptic precautions it is distinctly a dangerous method of treatment. The vagina and the physician's hands and his instruments having been thoroughly disinfected, the patient is preferably anesthetized, and with a probe-pointed bistoury or blunt-pointed scissors, one or two fingers are introduced to serve as a guide, and from four to eight incisions of one-quarter or one-eighth of an inch in length are made in the cervix uteri around the lumen of the os. It has been recommended that the longer incisions be at each side of the cervix, thus apparently imitating the process by which nature deals with these cases. After making these incisions, if the membranes have not been ruptured, it is well to rupture them, and to be prepared to terminate the labor by the use of the forceps, or, if indicated, by version.

In cases of premature labor, it must be remembered that the cervix lacks those physiologic changes that prepare it for dilatation at term; in such a case it is to be expected that rigidity will be encountered, and especial precautions must be taken to secure gradual dilatation.

The prognosis of labor complicated by rigidity of the cervix, when conducted under antiseptic precautions, closely approaches that of normal labor. In an extended study of these cases, Erdmann (*Archiv für Gynäkologie*, Band xxxix, Heft 1) finds that thorough antisepsis and prompt surgical interference reduce the mortality to practically that of labor in more favorable cases; recent Continental text-books of obstetrics recognize such treatment as indicated under the conditions that we have described.

SOME REMARKS ON PEPTIC ULCER, WITH SPECIAL REFERENCE TO TREATMENT.

By FREDERICK C. SHATTUCK, M.D.,

PROFESSOR OF CLINICAL MEDICINE, HARVARD UNIVERSITY; PHYSICIAN TO THE MASSACHUSETTS HOSPITAL, ETC.

So long as our knowledge of the pathogeny of peptic ulcer of the stomach and duodenum is imperfect, so long at least must our treatment be more or less unsatisfactory, especially from the point of view of prevention. It is not uncommon for writers at the present day to consider peptic ulcers, whether gastric or duodenal, under one head; and yet there seem to be some points of marked difference between them—points for which we are as yet unable to give adequate explanation. I say *seem*, because there are those whose statistics do not bear out the generally accepted view with which my personal experience certainly coincides. If the gastric form is more common in young and anemic females of the servant class, while the duodenal is generally found in males, occurs at a later period of life, and

is less frequently associated with anemia, how are we to explain the difference? Were it in our power to prevent anemia, gastric ulcers would develop far less frequently; but is it likely that much influence would then be exerted on the occurrence of duodenal ulceration? Taking life as we find it, the prospect is not brilliant for prophylaxis in this affection, and we must content ourselves with doing what we can to promote the recovery of those cases in which a diagnosis, at least probable, can be reached.

Clinically, cases can be divided into four classes: The first is that in which no symptoms ever occur. The existence of such cases is proved by the fact that either open ulcers or cicatrices are sometimes found in the bodies of individuals dying from accident or other cause wholly unconnected with the lesion under consideration. In these cases there can, of course, be no question of treatment, but they are important as showing that spontaneous cure may take place.

In the second class may be put those cases in which symptoms are entirely lacking until general perforative peritonitis, or hemorrhage, more or less profuse, appears. Local adhesive peritonitis is a more chronic process, and is usually associated with pain, though ulceration may extend into the pancreas or elsewhere without giving rise to any disturbance of which the patient is conscious. Early celiotomy offers the best chances of recovery from general perforative peritonitis, though these are not brilliant.

When hemorrhage is the first symptom, it is rarely immediately fatal; but its occurrence is diagnostic, provided that all other causes of bleeding from the upper digestive tract, aneurismal rupture, and the swallowing of blood derived from some part of the air-passages can be excluded. If such exclusion is practicable the case is at once removed from this to the fourth class.

The third class comprises those cases in which symptoms are present, but are simply those of indigestion, and in no way distinctive. Perhaps this class could be made much smaller in numbers if the degree of acidity of the gastric juice were tested in every case seeking advice for dyspepsia. As it is, these cases are and will long continue to be treated symptomatically by diet, in connection with pepsin, bismuth, hydrochloric acid, general tonics, etc., at least until some suggestive symptom appears, and then they also fall into the fourth class, with which it is the main purpose of this paper to deal.

This fourth class comprises all of those cases in which either the symptoms themselves or their grouping enables us to reach a diagnosis beyond reasonable doubt. From a therapeutic point of view these cases may, perhaps, be further subdivided into three classes.

a. The symptoms may be sufficiently characteristic, and yet of such moderate severity as to lead us to try to attempt alleviation and cure by the milder means of relative rest; a bland diet, moderate quantities at a time, at two or three hours intervals; large (teaspoonful) doses of sodic bicarbonate or other antacid, and chalybeates for the anemia. Seemingly good results are certainly thus attained in a considerable number of cases. Whether cicatrization of the ulcer is as permanent under this as under the more rigid treatment presently to be considered I do not know. I believe it would be more logical to adopt the severe treatment in all clear cases, but the logical and the practicable do not always coincide.

b. Hemorrhage may be so profuse and continued as to threaten death from asthenia. In such cases the indication is to keep the patient alive, treating him more with reference to his loss of blood than to the source from which it comes until the period of immediate danger seems to be passed.

c. In no small number of cases pain and vomiting are so troublesome, either by their long continuance, their severity, or both at once; or hemorrhage, without being at the moment alarmingly profuse, has been so frequent or has occurred for so long that the patient is incapacitated for work and ready to undergo any treatment which holds out the prospect of cure.

All assent to the broad principle of rest in the treatment of an ulcerated surface wherever situated. The healing of the gastric ulcer has a twofold source of delay: the peristalsis of the stomach during digestion, and the irritation of the free hydrochloric acid, which is likely to be excessive in amount in these cases. The first of these drawbacks is not operative in the duodenal form. No one disputes these facts, and everyone applies them in practice, but this application is, as a rule, far too limited, as it seems to me.

Some authorities make no mention of rectal alimentation; others advise it for a few days, either in place of, or as supplementary to, stomach feeding, which is cautious, in small quantities at frequent intervals, mainly of milk, and gradually increased. Ewald advises exclusive rectal alimentation for only three days. Rectal alimentation for several weeks is mentioned, but not especially enjoined. For at least five years I have treated every case of peptic ulcer with pronounced symptoms by absolute rest of the stomach, allowing only small quantities of water to enter it for at least a fortnight. At the end of that period milk prepared with peptogenic powder is given in dram doses every fifteen minutes, with gradual increase in the amount and lengthening of the intervals. Of course, absolute rest in bed is enforced to lessen the demand of the system for

nourishment and warmth. One by one the nutrient enemata are withdrawn as the gastric feeding is increased in amount and variety, the whole duration of treatment being usually from four to eight weeks. Pain and vomiting cease promptly with the cessation of gastric secretion and activity, and I have been led to believe that recovery is more complete and lasting than when food, however simple, is allowed to enter the stomach throughout or at earlier periods of treatment. Whenever it was practicable, I have had patients weighed before and at the completion of the fast, and have been surprised at the smallness of the loss in weight. A cleansing enema of soap and water is given daily to promote the absorptive power of the bowel, which receives once in six hours a raw egg, an ounce of expressed beef-juice, and enough fully peptonized milk to make six ounces. To this a few drops of laudanum are added if there is irritability of the rectum. Of course, we have no means of determining the size of the ulcer; and whether even a small ulcer can heal in a fortnight I do not know; but it seems rational to believe that more progress can be made in fourteen than in three days, and in most cases the fourteen can be prolonged to twenty-one, twenty-eight, or more, without risk of a high degree of innutrition. In one case of presumable duodenal ulcer, seen in private consulting practice, the patient was for thirty-five days fed exclusively by the rectum, and made a good recovery, remaining well for the two years which have since elapsed.

It will be seen that the aim of this paper is simply to advocate a more thorough and prolonged application of the principle of rest in peptic ulcer than is urged in the books, in the belief that thereby the chances of prompt and permanent recovery are materially increased. That drugs have any real influence in promoting the healing process there seems to be no evidence.

A NEW METHOD FOR THE CULTURE OF DIPHThERIA-BACILLI IN HARD-BOILED EGGS.¹

BY WYATT JOHNSTON, M.D.,
OF MONTREAL.

ALL who have had experience in the diagnosis of diphtheria, by culture-methods agree in praising their accuracy and promptitude. Unfortunately, the general practitioner, who must feel most of all the need of some accurate method for the prompt diagnosis of doubtful cases, does not seem disposed to avail himself of the new process, and the prophecy of Roux and Yersin, that the method would come into general use, appears still to be far from fulfilment.

Thinking that the chief obstacle lay in the dif-

¹ From the Pathological Laboratory of McGill College.

ficulty of obtaining serum for the culture-medium, M. Sakharof¹ recently suggested a simple plan by which slices of hard-boiled eggs, cut with a sterilized knife and placed in sterilized tubes, could be made to replace the serum.

Of this method I have no personal experience, but should imagine that the main objection would still exist, as the physician might not have test-tubes about him at the time when they were most needed.

I have, during the past two months, made use of a method which may be regarded as a modification of Sakharof's, and which does away with the necessity both of test-tubes and the preparation of media before they are actually needed for use.

I employ hard-boiled eggs, from which a part of the shell is removed with ordinary forceps, after being tapped so as to break it. In this way shell and shell-membrane can readily be peeled off from one extremity (by selecting the narrow extremity the air-chamber is avoided), leaving a smooth, glistening, moist surface, which offers a most tempting spot for making cultures. These are made, as in the case of serum, by touching the diphtheritic exudation with a sterilized needle and drawing the latter lightly from three to six times across the exposed white of the egg. Instead of the regulation platinum needle mounted in a glass rod, I employ either an ordinary needle or a bit of silver suture-wire held in an artery forceps. To guard the culture against contamination the egg has only to be placed upside down in a common egg-cup; it can afterward be wrapped in paper and transported, if necessary. The interior of the cup can be sterilized, if desired, by allowing a flame to enter it for a second or two, though I have not found this necessary, as the nutrient surface does not come in contact with the inside of the cup. The egg and shell are, of course, both sterilized by the act of boiling.

Five minutes' boiling suffices, and if the operation has to be done "while you wait," the egg can be cooled in a still shorter time by placing it in cold water. Strict attention to aseptic details is unnecessary, as the diphtheria-bacillus outstrips in its growth the contaminating organisms likely to lead to confusion. The appearance of the diphtheria-colonies at the expiration of twenty-four hours is the same as when they are grown in serum, but I have found the growth even more rapid, so that a colony is already visible in twelve hours. Confusion with micrococci is, of course, to be guarded against. The reliability of this method seems to be the same as that of the methods of Haffter and E. Roux. I have found one bacillus which attains visible dimensions within the same period, but as this also grew on blood-serum in the

manner characteristic of the diphtheria-bacillus, the great value of the method here described is not invalidated by that fact.

Although this minor modification of a now well-tried procedure might enable it to be employed by those destitute of laboratory outfits, I do not think it likely that this means of diagnosis will be utilized by physicians not habituated to laboratory methods.

It may be of interest to state here that the constant temperature of about 35° C., needful to insure the rapid and characteristic growth of the diphtheria-bacillus, can readily be obtained by placing in a cupboard or box with the culture, a large jar or pail of warm water, which is renewed from time to time, thus making an impromptu thermostat.

ORIGINAL LECTURE.

UMBILICAL HERNIA; OPERATION; CURE.— LIGATION OF FEMORAL ARTERY FOR POPLITEAL ANEURISM; CURE.— FECAL FISTULA CAUSED BY APPENDICITIS; OPERATION; CURE.

*Delivered at the Jefferson Medical College Hospital,
April 6, 1892.*

BY W. W. KEEN, M.D.,
PROFESSOR OF THE PRINCIPLES OF SURGERY AND OF CLINICAL
SURGERY.

CASE I. Umbilical hernia.—The first case that I shall have the pleasure of showing you is one of umbilical hernia. A woman, Mrs. M. D., thirty-seven years of age, entered Jefferson Hospital March 28, 1892, with an umbilical hernia nearly the size of two fists. She is the mother of six children. At the sixth month of her fourth pregnancy, in 1882, an umbilical hernia appeared, and soon reached the size of a fist. From that time to the present she has suffered great discomfort, to such an extent as to prevent her from earning her living by labor, and hence she seeks relief by an operation.

You must remember, in regard to hernia, that it only indirectly threatens life. It is, of course, a positive danger, but strangulation may be remote or may never come. Hence, I think that we have no right to operate, even with the slight danger attending such operations, without a full knowledge of the facts on the part of the patient and his full consent. I have explained the facts of the case to this woman and told her that, while there is no great risk, yet there is some. This risk she willingly accepts, in view of her present disability and her future danger.

The woman is now before you. The abdomen has been thoroughly disinfected. This is especially important, as the operation involves the umbilicus, where dirt readily accumulates and is removed with difficulty. We have used here a 1:500 instead of a 1:1000 sublimate solution. You observe the tumor. I find that the ends of two fingers can be readily passed through the wide umbilical ring. The parts are so flabby that it is difficult to make the incision quickly or neatly. I

¹ Annales Inst. Pasteur, June, 1892.

enter the sac and find that the bowel is not adherent. Having opened the sac, I find that the ring readily admits three fingers. The belly wall is so thin that the best result will be attained by freshening the edges of the ring, sewing them together, and then applying a ligature around the sac. I shall not cut out the umbilicus (omphalectomy). When I commenced the operation I had intended to do an omphalectomy, but you must remember that no surgeon, before he opens an abdomen, can tell exactly what he is going to do, and you must never be so wedded to a preconceived purpose that you will not change it if you see good reason to do so.

Having removed a strip of tissue from the entire edge of the ring, I wash out the abdominal cavity, to remove the blood that has got in. When I was a student, and for a long time afterward in fact, the peritoneum was the great surgical bug-bear. To-day you see it invaded with impunity. In fact, I believe it to be even more tolerant than most other tissues, but on one condition only, viz., that your aseptic and antiseptic technique is rigidly carried out. It is one vast lymph-sac and will absorb a good deal of blood without trouble, but at the same time I believe in giving the peritoneum as little to do as possible. I use the water quite warm, and this is an advantage, as the shock is thus lessened.

A large flat pad of gauze being placed under the opening, I am now ready to introduce the stitches. In doing so great care must be exercised that the intestine is not injured; the gauze pad is here a great help, while at the same time it absorbs the blood caused by the punctures. I have now closed the peritoneal cavity and shall next dissect out and remove most of the sac. You see how corded its internal surface is from the presence of connective-tissue fibers. I also remove a large piece of redundant skin and am now ready to close the wound. In doing so, I include in the sutures the borders of what is left of the sac, which will tend to fix it more firmly, and so prevent any recurrence of the hernia.

As you will note, the patient has a flabby belly. When I remove the sutures, and possibly before, I shall support the abdomen by adhesive straps, and certainly by a firm binder, and when she gets up at the end of three weeks or a longer period, I shall make her wear an elastic belt for months or a year or two, so as to support the abdominal wall.

[NOTE.—Her highest subsequent temperature was 99°, and she made a speedy recovery. Since leaving the hospital she has returned on account of the discharge of three of the silk ligatures. The hernia remains cured.]

CASE II. *Ligation of the superficial femoral artery for popliteal aneurism.*—The next patient is one that you have already seen. It is the case of popliteal aneurism which I have already twice attempted to cure, but failed each time. I brought the patient before you four weeks ago and tried forced flexion, flexing the heel to the buttock, securing it there by a bandage around the bent leg and thigh, and also by attaching the heel of a slipper on the foot to a bandage around the waist. In this way I kept the artery closed for one week, but failed to effect a cure. It took ten days to overcome the contraction of the limb which followed this treatment. Next I tried the

effect of instrumental compression. This also resulted in absolute failure, as the man could not bear the pressure. He is very anxious for a radical operation and a cure as speedily as possible. We could try one other method, namely, Esmarch's bandage, but he is so anxious for operation that I shall ligate the femoral artery at once. You have once before seen this operation done during the present session, by my colleague, Professor Brinton, in the case of the man on whom Mr. Bryant, of London, lectured, who in that case advised the adoption of other than operative measures before resorting to ligature, and rightly so, for they are less dangerous and often effect a cure. You will notice, however, that in both cases those measures have failed, and we must come to the cutting operation.

The patient, J. B., is a man fifty-four years of age, who entered Jefferson Hospital March 7, 1892. In 1864 he contracted syphilis, but has never had any violent secondary symptoms. He is a night watchman in a chemical works, and has to make eleven rounds, aggregating 1584 steps every night! Six months ago he noticed a small tumor in the left popliteal space, which has progressively increased in size and has caused increased pain. On examination a distinct swelling is found filling most of the popliteal space, pulsating synchronously with the pulse and ceasing upon pressure on the femoral artery. The case illustrates well two of the most frequent causes of aneurism—syphilis and the wear and tear on the arterial walls caused by the constant bending of the artery at the knee by reason of his occupation.

This chart will serve to recall to your minds the position of the femoral artery. Under the middle of Poupart's ligament runs the common femoral artery. I like this method of designation—the *common femoral*—much better than *the femoral*. Then the common femoral divides into the *superficial femoral* and the *deep femoral* or *profunda femoris* arteries. Important as it is anatomically to distinguish between the common, the superficial, and the deep femoral, it is still more important surgically. Ligation of the common femoral—that is, the portion extending from Poupart's ligament down to the bifurcation—is an exceedingly dangerous operation. As a general rule, I should prefer to ligate the external iliac, as it is a safer operation. You will remember that the profunda femoris, or deep femoral, comes off from the common femoral, an inch and a half below Poupart's ligament. About an inch and a half further down, that is three inches below Poupart's ligament, is the apex of Scarpa's triangle, which is formed by the sartorius muscle on the outside, the adductor longus on the inside, and Poupart's ligament above. I shall fix the position of the artery by touch, and draw a line from that point to the internal condyle of the femur. This will give the line of the artery, and I shall make a point three inches below Poupart's ligament, the center of an incision three inches long. I shall then dissect down through the skin, superficial and deep fasciæ until I reach the sartorius muscle. Pushing the muscle to the outside, I expect to readily find the superficial femoral artery in its sheath.

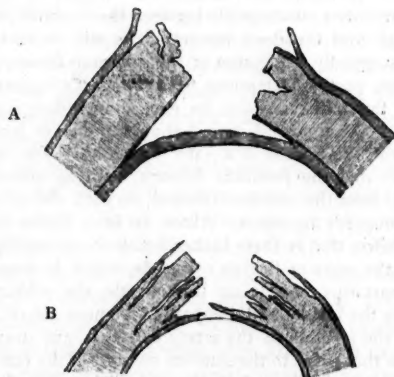
Having found the artery, I shall separate it from the vein with scrupulous care. The femoral vein is very large. At the groin it lies immediately inside the artery, but it very quickly takes a quarter of a turn, so that at the

apex of Scarpa's triangle, the vein is already behind the artery. It is of the utmost importance that the vein be not wounded.

Having separated the artery from the vein, then came the questions: What material shall we tie with? what force shall we employ? and what knot shall we use? The material that I shall use is the floss silk of the dentists. I use it because it is soft and spreads out into a flatter band than twisted or braided silk, and so brings larger surfaces of the inner coat of the artery into contact, and also because its fluffiness favors the entanglement of its threads, and so prevents any slipping of the first knot while the second is being made. Each of these is an important factor in securing occlusion of the artery. I also use it because it has been so strongly recommended by Ballance and Edmunds in their recent magnificent work on the *Ligation of Arteries in Continuity*. This work is the result of years of research, experiment, and investigation, and is entitled to profound respect. Mr. Ballance, especially, has already shown himself to be such a thoroughly good surgeon in other matters, that I have the greatest respect for his views.

In tying the artery I shall use only sufficient force to approximate the surfaces of the intima, but not enough to rupture the internal or middle tunics. Following the teaching of Mr. Jones, a century ago, it has been the almost universal practice among surgeons to tie with such force as to cut through the middle and the internal coats. In fact, you will generally see the surgeon, or his assistant, tie with all the force he can use short of breaking his thread. If you look in the work to which I have alluded, you will be surprised to find how thin a layer there is between the ligature and eternity, when the artery is tied in this way. (See Fig. 1).

FIG. 1.

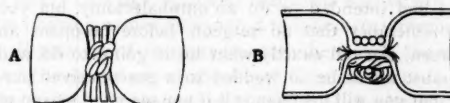


Injuries inflicted upon human arteries by a ligature. A, common femoral; B, subclavian (third part) showing how little even of the external coat is unraptured. (BALLANCE and EDMUNDS.)

You should also note the fact pointed out by these authors, that Listerian practice has diminished the dangers of ligation of the arteries very little, for the very reason that we have been applying too much force to the ligatures. The researches of Ballance and Edmunds have settled this point, and settled it in favor of such force as will

approximate the intima, but will not rupture the two inner coats. This approximation should be by *surfaces* and not be a mere *linear occlusion*. Surface adhesion of the intima is even more important than the subsequent formation of occluding thrombi. (Fig. 2.) They

FIG. 2.

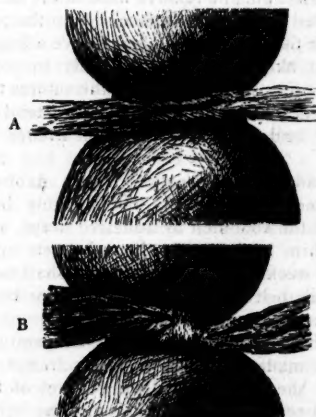


The application of four ligatures. A, external view; B, appearance on section, showing the approximation of a long portion of the surfaces of the tunica intima. (BALLANCE and EDMUNDS.)

very properly appeal to Nature, as Dr. J. Collins Warren, of Boston, has also done in his admirable book on the *Healing of Arteries*. When, for instance, Nature closes the umbilical artery, the internal or middle coat is not ruptured. When other arterial canals are closed pathologically, there is no rupture of the internal or middle coat. The intima is simply approximated, a proliferation of cells takes place, and the vessel is transformed into a cord. In tying the femoral artery, then, I shall employ only a force that is sufficient to simply bring the internal walls in contact. This will require a force of about two pounds.

In securing the ligatures in this case, I shall employ what Ballance and Edmunds term the "stay knot." (Fig. 3.) In this knot two or more ligatures are applied

FIG. 3.



The "stay knot" of floss silk. A, first stage; B, completed. (BALLANCE and EDMUNDS.)

side by side. On each one of them an ordinary single knot, with two turns, is made and the ends laid down. A similar knot is then tied on the other ligatures. The ends of both ligatures are then taken together and drawn upon equally, and the second knot is tied as though they were but one thread. If there are multiple ligatures they are tied in pairs. The double ligature of floss silk thus brings in contact a large surface of the intima.

Last evening, in Bridgeport, Conn., I made an address at the Centennial Celebration of the Fairfield County

Medical Society. It is interesting to note that this Society has seen every artery in the body tied for the first time, with the exception of the femoral. In 1785, John Hunter tied the femoral artery, but there was not another artery tied in its continuity until 1803, when the carotid artery was ligated by Abernethy, and the other arteries were tied at later periods. Therefore, in the life of this one Society, there has been seen an enormous progress in this one department of surgery.

We shall now proceed to ligate the artery. You must be careful to locate Poupart's ligament accurately. Do not depend upon the eye, but place one finger on the anterior superior spinous process of the ilium and another on the symphysis (not the spine) of the pubes, and midway between these two points will be found the artery. I next measure downward three inches, and here you should be careful to measure exactly, for if you depend upon the eye you will probably get far too low—into Hunter's canal, instead of at the apex of Scarpa's triangle. Having determined this point, I make an incision a little obliquely to the line of the artery, and I at once come to the inner edge of the sartorius muscle, and just under its border I find the vessels in the common sheath. I shall disturb the sheath of the artery as little as possible, and I do not want to see the vein at all. I approach the artery from the inside rather than from the outside, because the vein lies to the inner side and behind. I now pass the double floss silk ligature and tie in the manner described, without having even seen the vein, and with very little mechanical disturbance of the sheath.

The operation is done, but the case is not yet cured. These are two very different things. For at least ten days after I have tied the femoral artery I am anxious. At the end of this time the parts have become so consolidated that there is little risk of secondary hemorrhage. There is also a possibility that gangrene may follow the cutting off of so large a portion of the blood-supply of the leg. The limb will be enveloped in cotton, and surrounded by hot-water bags, in order to keep up the heat of the part, and so tend to prevent gangrene.

[NOTE.—Recovery was immediate and complete. On the sixth day after ligation pulsation was detected in the dorsalis pedis artery, through the collateral circulation. In October, 1892, the aneurism was still cured, and he was at work.]

CASE III. *Fecal fistula following an abscess from appendicitis; operation; cure.*—The next case is one of unusual interest and probably of unusual difficulty. It is that of the young man whom I showed you a week ago with a fecal fistula in the right loin. I propose to make an incision and trace the fistula to its source, but after we get a large wound with possibly a small opening at the mouth of the fistula, the question arises in my mind, If I cannot easily see this fistula, how shall I follow it? In order to overcome this difficulty, I have provided a bag filled with hydrogen, and if I find difficulty in following the sinus I shall inflate the colon through the rectum and note where the gas bubbles into the wound. Air would answer just as well, but hydrogen being lighter, will escape more readily.

The patient states that on March 20, 1891, he had an attack of appendicitis. A large swelling formed in the right iliac region and rapidly extended upward and backward into the lumbar region. Ten days later it

was opened to the right of the first lumbar spine, when pus, gas, and feces escaped, and have continued to discharge ever since. By the way, one of our English friends recently remarked at a meeting of a medical society that this word *appendicitis* "might be American, but it was not English." It may not be English, but for all that it is a very good word and is rapidly being adopted both in England and on the Continent. It applies to a distinct condition and it will live, especially as it gives greater precision to our language, and, therefore, to our thinking.

What I propose to do is to follow the sinus to its source, and then do whatever may seem to be necessary. I first slit up the sinuses from the four openings and find that they all unite in one rather wide track, which is so evident that the hydrogen will not be needed. On extending the cut in the line of this sinus and exploring it, I find that my finger readily enters the colon and thus discloses the source of the fecal discharge.

This formation of a fecal fistula, is a rather unusual termination of appendicitis, and yet, curiously enough, we have in the wards, at this moment, a second case in an old woman whose general health forbids interference, in whom exactly the same condition exists. It should be to you another lesson in favor of early rather than delayed operation in those cases in which an abscess forms. Not only may the abscess burst into the general peritoneal cavity, but it may evacuate itself through the rectum, the bladder, the vagina, or, as in this case, externally, and may, at the same time, burst into the colon. Even as to life itself, spontaneous external evacuation is the most dangerous, and as it carries with it, even if the patient recovers, the danger of a fecal fistula, it is to be avoided. Sometimes such an abscess, if the abscess runs upward, may even perforate the diaphragm and the pus may be discharged through the bronchial tubes.

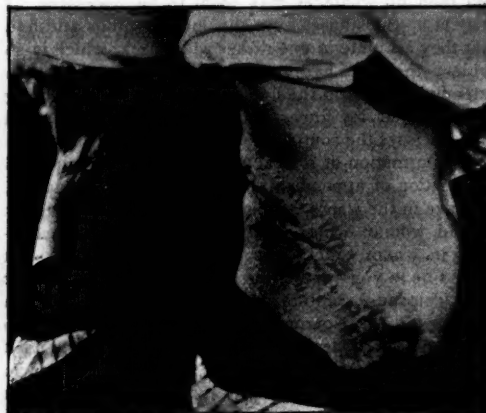
Besides this sinus leading to the colon, I find an offshoot which goes down, parallel with the crest of the ilium and then with Poupart's ligament to the site of the appendix. Laying this open widely, I make a search for the appendix, but cannot find it, as it is covered in at some unknown point by a mass of adhesions and new tissue. In following the sinus toward the appendix you notice that the peritoneal cavity has been opened, and this adds a serious complication to the case, in view of the difficulty we may have to keep such a wound free from infection in case the attempt to close the fistula in the colon is unsuccessful. The opening in the peritoneum was unavoidable, and I shall close it at once with some stitches in order to diminish the danger as much as possible. The search for the appendix being fruitless, and it being fairly evident that there is no escape of fecal matter through the appendix, I curette liberally the surface of the sinus and then turn my attention to the colon.

The opening in the colon is large enough to admit my forefinger. It is bound to the surrounding tissues by rigid adhesions which are very difficult to break up, and even when this is done I find difficulty in approximating the edges. However, the attempt must be made if the fistula is to be cured. All the margins of the opening are freshened, and then I introduce six Lembert stitches of silk and draw the edges together, invaginating

their borders. Considerable force has to be used in order to approximate the edges, on account of the widespread and dense adhesions, and I am very much afraid that they will ulcerate before sufficient adhesions form to close the opening.

Now that this stage of the operation is finished, you can appreciate what an immense wound this is. It stretches from near the spinal column, all the way around to the middle of Poupart's ligament, and is thirteen inches in length.

FIG. 4.



Photograph of the wound when healed. The figure to the right shows the front view; that to the left is the reflection of his back in a looking-glass. The two show the entire length of the wound. (Photographed by Dr. C. A. Weaver, Jefferson College Hospital.)

[NOTE.—The entire wound healed by first intention, except posteriorly, where, on the fourth day, feces reappeared in small quantities in the wound. After a few days, however, this discharge ceased and the wound healed. It reopened later for a brief period, but now (November 20, 1892) has been healed for some months, and apparently permanently.]

CLINICAL MEMORANDUM.

A CASE OF EXTREME PUERPERAL ANEMIA AND NEPHRITIS; DELIVERY AT TERM WITH FORCEPS APPLIED, UNDER CHLOROFORM, ABOVE THE SUPERIOR STRAIT; RECOVERY OF MOTHER AND CHILD.

BY HARRIS A. SLOCUM, M.D.,

PROFESSOR OF GYNECOLOGY IN THE PHILADELPHIA POLYCLINIC;
VISITING GYNECOLOGIST TO ST. CLEMENT'S.

THIS case is reported to show what extremes a pregnant woman may reach in those conditions that, by education and experience, we dread to encounter; and the means that, in this instance at least, were successful in enabling the mother to reach term and be delivered of a living child.

Mrs. M. P. was married at the age of sixteen years and six months. Menstruation began at fifteen. Her last period was on January 3, 1892, conception probably

taking place about January 14th. By the 2d of February morning sickness had begun, gradually increasing until the end of the month, when vomiting occurred and quickly increased, so that everything taken into the stomach was rejected. She rapidly lost flesh and color, and when I first saw her at my office on March 26th she was so emaciated and weak that I was apprehensive about her ability to reach home in safety.

The bowels were inactive, and a preparation of malt with cascara was given, with cerium oxalate for the nausea. The cascara was partially successful, but the cerium oxalate had no effect.

The urine was pale, with a tinge of smoky red, and contained 1 per cent. of albumin. The specific gravity was 1004; the quantity averaged twenty ounces in twenty-four hours. The microscopic examination showed red corpuscles greatly disintegrated, small blood plaques, many pus and young epithelial cells, hyaline, granular, and epithelial casts, and hyaline disks. Severe occipital and frontal headache, marked pain throughout the lower half of the abdomen and pelvis, constant nausea and vomiting, and progressive emaciation and pallor, when considered in relation with the urine analysis, brought the case within the range of early operative interference.

Having had good results from the use of theobromine sodio-salicylate in acute nephritis, I determined to test its value here, and gave her capsules containing seven and one-half grains every four hours. This was followed so quickly by the disappearance of the pelvic and abdominal pains and the occipital headache, and an increase of the urine to sixty ounces, that no reasonable doubt exists of its having been the useful factor.

She was put upon a strictly milk diet, but the vomiting did not cease until this was changed to peptonized milk. This was continued intermittently for several weeks, but as her sufferings diminished she became less careful, returning to solid food, contrary to advice, and paying the penalty of emesis and return of headache. At these returns her condition would become so alarming that I was several times on the point of inducing abortion, and would probably have done so if I had not known of her very great desire to have a living child. Before leaving the city, in the summer, I carefully went over the case with my assistant, Dr. Homer C. Bloom, and he agreed to hold himself in readiness to induce labor should it appear necessary.

During my absence the patient had another severe attack of vomiting and a return of all her old symptoms, and a physician near at hand was hurriedly summoned, who, not having the facts of the case in his possession, administered morphine, which resulted in intensifying her distress, and almost stopping the action of the kidneys altogether. Finding that she was growing rapidly worse, they sent for my assistant, who carried out the original treatment with success.

During September and October, until labor began, the urine contained about one-half of one per cent. of albumin, the specific gravity fluctuated between 1004 and 1012 and the daily amount between sixty and seventy-five ounces. At no time did the albumin disappear from the urine. On the contrary, the amount several times increased to semi-solidity on boiling, following a return to solid food and the upright posture.

On the 20th of October labor began. The pains were

very weak but very painful, and the patient soon lost her self-control and exhibited general twitchings, which became more marked as the day went on. At about 4.30 in the afternoon she seemed in imminent danger of eclampsia, and I determined to dilate and deliver under an anesthetic. Almost no dilatation had taken place since morning, the os barely admitting two fingers. Dr. Bloom administered chloroform, and with Barnes's dilators I enlarged the os to nearly full relaxation, and then waited to watch the effect of a contraction. These passed with no effect at engaging, and I then applied the forceps inside the uterus above the superior strait. In about twenty minutes the head was at the vulva, and was slowly and carefully delivered, and the forceps removed. The partly asphyxiated child was quickly resuscitated and the placenta expressed. This had hardly been done when the blood poured out of the uterus in a stream. Compressing the uterus with one hand on the abdomen, the other carried the nozzle of a syringe into the cavity, and hot water was injected against the walls. All blood-clots were quickly removed, and the uterus shut down, only to relax and again fill as soon as the hand was removed.

The same procedure was again tried with the same result—contraction and subsequent relaxation. Finding that the fundus did not rise beyond a certain point (about an inch below the umbilicus) I concluded to let it alone, and watched it for several minutes. No further enlargement taking place, the bandage was applied and the chloroform taken away. The bleeding ceased. If I had continued to follow the general rule to empty the uterus, I should have soon emptied all the blood of her body. The uterus gradually contracted, expelling clots until it reached its normal size. I saw mother and child December 1, and both are well.

This case illustrates the following points:

1st. A pregnant woman may present alarming symptoms of nephritis with great anemia and exhaustion, and yet go to term.

2d. The value of theobromine sodio-salicylate in aiding to bring this about (urea was increased by it), together with the use of peptonized milk as a food. (I believe we had here a merging of the nausea of nephritis into the nausea of pregnancy. The theobromine sodio-salicylate relieved the former, but had no effect upon the latter.)

3d. The danger of using morphine to relieve nausea in pregnancy without first ascertaining the condition of the kidneys.

4th. An instance in which the golden rule in post-partum hemorrhage—to "empty the uterus"—found an exception; for here the uterus was exhausted, and the clots formed the only means for closing the sinuses. There was not blood enough left in the body to stimulate the contracting centers.

MEDICAL PROGRESS.

Two Cases of Hemorrhagic Bacteremia in the Newborn.—TAVEL and QUERVAIN (*Centralbl. f. Bakteriöl. u. Parasitenk.*, xii, 17, p. 577) have reported the case of a premature male child, in which infection of the umbilicus was noted a few days after birth. On the tenth day

multiple and rather extensive hemorrhages took place beneath the skin. At the same time rigidity of the skin of the lower extremities was observed. The child died on the thirteenth day. At the post-mortem examination, in addition to the subcutaneous hemorrhages, the epidermis was found detached in places; a small amount of pus was present at the umbilicus; the pleural cavities contained bloody fluid; there was double hemorrhagic pneumonia; hemorrhages had taken place beneath the pleura and the mucous membrane of the stomach and intestines, and into the parenchyma of the kidney. In the blood from various sources, in the tissues of the various organs, and by cultivation streptococci were found in considerable numbers, with a small number of staphylococci. In a second case, also in a premature child, the signs of pneumonia appeared on the tenth day, and death took place on the twelfth day. At the post-mortem examination, double pneumonia was found; there were, besides, hemorrhages beneath the epicardium, beneath the dura mater, into the pia mater, into the cerebral substance, and into the ventricles. In the blood, by cultivation, and in sections of the lung-tissue, staphylococci aurei were found in great preponderance. The special feature of the cases resides in the occurrence of the hemorrhages, which cannot be ascribed to external influences, as the labors took place without instrumental intervention. The inference is clear that infection took place by the umbilicus. The infants, by reason of premature birth, were less able than mature children to resist the invasion and multiplication of the organisms.

Bilateral Oophorectomy During Pregnancy.—POLAILLON (*Archives de Toccol. et de Gynéc.*, xix, 10, p. 727) has reported the case of a laundress, twenty-nine years old, who for six years had had an abdominal swelling. For three months there had been a sense of weakness and dyspnea. The woman came under observation shortly after having been suddenly seized with severe pain in the hypogastrium and in the loins, the abdomen becoming distended; so that the development of peritonitis was suspected. On examination, a fluctuating ovarian cyst was detected, filling the abdomen to the level of a line four or five fingers' breadth above the umbilicus. The pain was most intense in the left flank. On vaginal touch the cervix uteri was found soft, and a round elastic tumor, as large as an orange and apparently the body of the uterus, was detected occupying the concavity of the sacrum. Menstruation had been absent for five months. The general condition was bad; the patient was emaciated, suffering intense pain, vomiting, and having fever. Operation was decided upon. The left ovary was found cystic, degenerated, and as large as a kidney, with a lamelliform pedicle. The right tube was adherent to the cyst, and the corresponding ovary as large as a hen's egg, bosselated and cystic. There were numerous adhesions with the mesentery and with the bowel. The uterus was not disturbed. The operation was unattended with any unpleasant sequelæ. Later the signs of pregnancy became better defined and the uterus rose to its usual position. The patient was carefully watched; five and a half months after the operation labor set in and passed off without any complication.

Congenital Syphilis.—ERLENMEYER (*Zeitschrift f. klin. Medicin*, xxi, 3 u. 4, p. 343) has reported seven interesting cases of congenital syphilis which he has studied in their relations to certain diseases of the nervous system. He expresses the view that late forms of congenital syphilis, so-called syphilis hereditaria tarda, may appear later than the twelfth year—that is hereditary syphilis may remain latent more than twelve years. Puberty, traumatism, and febrile affections may afford the necessary stimulation to arouse into activity a latent congenital syphilis. The law of Colles, that the mothers of children congenitally syphilitic through the fathers, is not without its limitations. Mothers that have given birth to congenitally syphilitic children may become syphilitic, though not necessarily. Immunity to syphilis is not identical with infection with syphilis. The law of Kassowitz as to the spontaneous gradual attenuation of the intensity of the syphilitic hereditary transmission is not absolute. Children born late may be infected in more intense degree than those born previously. Hereditary syphilis may alternate with the sexes; thus, if after the birth of a congenitally syphilitic child a non-syphilitic child of different sex is born, it is not proved that the capability of hereditary transmission through the father is exhausted. In arriving at a conclusion all of the children must be considered. Anti-syphilitic treatment of the parents exerts a most favorable influence upon subsequent children. A form of cerebral disease characterized by unilateral convulsions and lack of development is most commonly of syphilitic origin. The so-called cerebral paralysis of children and congenital epilepsy, with or without idiocy, are frequently dependent upon congenital syphilis.

Gout in a Child Eleven Years Old.—MARBOUTX (*Lyon Medical*, 1892, No. 43, p. 264) has reported the case of a girl, eleven years old, in which, after a brief period of malaise, sore-throat, and difficulty in swallowing, pain, redness, and swelling appeared at the metatarso-phalangeal joint of the right great toe. On the following day, the symptoms subsided with the abruptness with which they had appeared, some discoloration, pain, and swelling, however, persisting. A day later, the great toe of the left foot became similarly involved. Forty-five grains of sodium salicylate were administered in twenty-four hours, and decided improvement followed. There was no doubt from the mode of onset, from the appearance of the affected parts, and from the progress of the case, that the condition was gout. There was no family history of gout on either the father's or on the mother's side. The father had, however, eighteen months previously, had an attack of the same kind as the child. The child did not suffer from migraine or from gastric disorder or from cutaneous eruptions; nor had menstruation occurred.

THERAPEUTIC NOTES.

Alumol (HEINZ, *Internationale klin. Rundschau*, No. 44, 1892, p. 1807) is the name given to a sulphur combination of aluminium, a new antiseptic and astringent that possesses the property of penetration. It is a white or faintly pink, not hygroscopic powder, soluble in water and capable of being prepared in the form of ointments,

plasters, varnishes, etc. The agent precipitates albumin, in an excess of which, however, it is soluble. On account of its penetrating property it commends itself especially for the treatment of gonorrhea. In the case of males a 1 per cent. solution may be employed; for the treatment of gonorrheal endometritis, sticks containing from 2 to 5 per cent. of alumol may be used. In more concentrated proportions the agent is a cauterant. Alumol is also useful in the irrigation of wounds or cavities, checking suppuration and secretion. Ordinarily, solutions of from $\frac{1}{2}$ to 1 per cent. suffice; for abscess-cavities a 10 per cent. solution is to be preferred. The agent has proved especially useful in the treatment of the chronic inflammations and infiltrations of the skin. It may be conveniently applied by means of gauze or as a varnish. In dermatologic practice rather strong solutions (of from 10 to 20 and 50 per cent.) are required. Alumol also has a field of usefulness in the treatment of diseases of the ear.

For the Night-sweats of Tuberculosis.—NEUSSER (*Jahresber. d. Rudolph-Stiftung*) has reported the results of the employment of potassium tellurate in the treatment of the night-sweats in a considerable number of cases of pulmonary tuberculosis. In the majority of cases the sweating was controlled or diminished. The usual dose was one-third of a grain given at bedtime. In some cases a tolerance to the drug became established, so that the dose had to be doubled. In exceptional cases the appetite seemed to be impaired as the result of the medication; in some cases, too, a narcotic effect seemed to be produced. Toxic or unpleasant manifestations were exceptional. Most of the cases were well advanced in the disease, and no influence upon the general condition was observed.—*Internationale klin. Rundschau*, 1892, No. 45, p. 1846.

The Treatment of Pernicious Anemia.—In a communication read before the Medico-Chirurgical Society of Edinburgh, GIBSON (*Edinburgh Medical Journal*, October, 1892, p. 329) presented the view of William Hunter that the manifestations of pernicious anemia are dependent upon excessive hemolysis, resulting from the presence of toxic matters in the gastro-intestinal tract, and that a rational therapeutics would consist in the administration of intestinal antiseptics. Governed by these views the treatment indicated was adopted in a case of pernicious anemia and in one of simple anemia, in both with excellent results. Two grains of betanaphthol were given two or three times a day, in pill, after meals. To obviate the irritation sometimes occasioned by beta-naphthol, a preparation of bismuth, preferably the salicylate, may be given in conjunction with it.

For Ozena.—

R.—Iodol. }
Acid. tannic. } aa . . . 3ss.—M.
Acid. boric. }

Ft. pulv.

S.—Use as snuff, at first five or six times a day, subsequently three times a day.

TURBAN, *Rif. Med.*; *Munch. med. Wochenschr.*

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SATURDAY, DECEMBER 10, 1892.

ETHYL BROMIDE AS AN ANESTHETIC.

DR. LEVIS, of this city, and DR. NUNNELEY, of England, were the first, we believe, to support very strongly the claims of ethyl bromide as an anesthetic, yet it has not grown into much favor here, chiefly because two persons died in this country from its effects a short time after its introduction into practice. These deaths, we have no doubt whatever, were directly due to carelessness—carelessness in the administration of the drug and carelessness in the selection of the sample. Moreover, we assert, with little hesitation, that ethyl bromide occupies at present a most satisfactory position as an anesthetic—a position, it is true, much below that of chloroform, much below that of ether, yet with bounds so exactly defined by the peculiar powers and defects of the agent, that its use in judicious hands is productive of the best results—of a narcosis at once easy, comfortable, and safe.¹

The anesthesia, it must be at once observed, lasts but a few minutes, and cannot be renewed without

difficulty and danger. Hence the cases that are suitable for the administration of ethyl bromide are these (we quote from KÖLLIKER, *Centralblatt für Chirurgie*, No. 20, 1891): (1) Incisions into abscesses; (2) Incisions into phlegmonous swellings, if they are not large; (3) Tenotomies; (4) When the thermo-cautery is used (angiomata, phagedena); (5) Extraction of foreign bodies; (6) Extirpation of small tumors; (7) Tuberculous joints, tuberculous otitis, small lupous swellings. We may add that it is used largely in the extraction of teeth (PHILLIPPS, SCHEPS, SCHNEIDER). According to KÖLLIKER the dose for children ranges from five to ten grams; for adults, from ten to fifteen grams. The duration of the narcosis should be from one to three minutes.

Most important is the method of administration, and, as neglect and carelessness in this matter are attended with dangerous consequences, we shall go fully into this subject. We cannot do better than recommend here, with the modifications that a simpler case admits, PROF. KEEN's paper on the organization of an operation (*American Journal of the Med. Sciences*, January, 1891), and, more especially, some valuable observations by DR. TURNBULL on MARION SIMS's fatal case with this drug (*N. Y. Med. Record*, 1880, vol. xvii, p. 439). The less elaborate directions needed in the present instance are thus described by KÖLLIKER: "We make precisely the same arrangements as when we are about to use chloroform, that is, we examine carefully the heart and lungs, and free the neck and trunk of close-fitting garments. The patient is kept lying down. All interruptions are sternly avoided, for it is important that the patient be free to yield at once to the odor of the ethyl bromide. Our chief care being to secure absolute quiet in the room, we proceed next to scatter a few drops only of the anesthetic in the mask (SKINNER's), and in a second we pour in the whole quantity we intend to use, and lay the mask, as nearly full of vapor as possible, on the patient's face." We have but one thing to add, a direction we owe to v. ZIEMACKI (*Langenbeck's Archiv*, Bd. 42, 1891). The first four drops are intended for the first inhalations, to render them easy, for, be it observed, if the beginning of the anesthesia is unimpeded by choking and coughing on the part of the patient, unconsciousness comes on quickly. As a rule, anesthesia is complete in fifty or sixty seconds (KÖLLIKER). Upon this subject STERNFELD says: "With one exception I have

¹ Ethyl bromide, C_2H_5Br , must not be confounded with ethylene bromide, $C_2H_4Br_2$, a substance incomparably more dangerous and devoid of anesthetic powers. For accounts of such mistakes, cf. Hirsch, *Therapeutische Monatshefte*, 1888, p. 556; v. Ziemacki, *supra*, *Lancet*, 1891, p. 101.

always used, in giving this anesthetic, the mask (ESMARCH'S) in preference to other means, and with good results. I pour the ethyl bromide in drop by drop—a procedure that indeed delays the narcosis, but makes it much pleasanter for the patient. I cannot assent to the practice of using rather larger doses all at once, and then laying the mask closely over the mouth and nose" (*Münch. Med. Wochenschrift*, 1890). The truth seems to be that the anesthesia should be begun with small doses, and continued speedily with larger ones.

It is a good plan, on beginning, to bid the patient hold up an arm, for, obviously, anesthesia must be near when the limb falls. The pulse should be watched, certainly until anesthesia begins, and, better, throughout the operation.

Ethyl bromide must not be used in the following cases: (1) pulmonary tuberculosis, (2) marked anemia, (3) acute and chronic bronchitis, (4) emphysema, (5) heart-disease, (6) hysteria, (7) alcoholism; nor, unfortunately, on account of its tendency to cause spasm of the muscles, should it be used in (8) luxations, setting of bones, etc. For women and children it is warmly recommended. It appears to be less efficacious as an anesthetic in the case of robust men. We dissent from the opinion of some that it is useful in labor, for its tendency to cause muscular spasm is a valid objection to it here.

In conclusion, we append a short account of medical experience with ethyl bromide. Meanwhile one thing should be said before we take leave of the subject. It is that a practitioner is not justified in using ethyl bromide unless he knows that the sample he possesses is pure; and by pure we mean that it must not contain free bromine, that it must have been kept in a cool, dark place, unexposed to light and air. Lastly, but not least in importance, it must yield a characteristic, faintly ethereal odor, which by some is compared to the odor of garlic.

To come, then, to the practical knowledge of the drug, V. ZIEMACKI sums up an admirable paper with a report of 600 successful cases. In one the narcosis was prolonged to twenty-five minutes and 60 grams were used.

KASPROWICKZ reports 200 cases, and approves of it more for women and children than for men; SZUMANN, 120 successful cases; WESSLER, 41; ASCH, 200; GUNSBURG, 200. The last observer

noticed epileptiform symptoms in the case of a drunkard, and calls attention to a fall of blood-pressure during the narcosis. PHILLIPPS recommends it in dentistry and in minor operations; SCHEPS (200 cases), ESCHRICHT, and SCHNEIDER are of the same opinion. SCHEPS insists that the preparation must be pure. WIEDEMANN and TSCHUNICHIN recommend it as entirely safe in labor. KÖLLIKER, whose paper no one can afford to neglect, says: "It often happens that the chief of a surgical clinic must debate with himself what anesthetic should be used for this or that minor operation. I believe that ethyl bromide is especially fitted for these cases." Not less laudatory is the opinion of STERNFELD: "I consider ethyl bromide perfectly safe if it be prepared in the present manner and used with attention to those rules and precautionary measures that cannot, indeed, be neglected in any case of anesthesia." It is worthy of remark that STERNFELD insists that these good results have been obtained by exacting the utmost purity in the composition of the drug.¹ After these praises we can add nothing so well as CHISHOLM'S opinion (*Maryland Med. Journ.*, 1883), summing up an experience of 400 cases, "that bromide of ethyl is the most perfect anesthetic for short, painful operations;" or MONTGOMERY'S, of the same class of operations, "I can safely claim to have administered it [ethyl bromide] in nearly five hundred cases, and I have seen none in whom there seemed to be any dangerous symptoms attending its use, while nausea and vomiting are rare results" (*Therapeutic Gazette*, June 15, 1892). Less favorable is the opinion of TERILLON, who noticed ugly symptoms of asphyxia; of BUXTON, who says, "the presence of these bodies (*i. e.*, bromoform, free bromine, phosphorus) renders the impure ethyl bromide singularly dangerous, and until we can be sure of the purity of any given sample I think we are scarcely justified in its use for anesthetic purposes."

There is an overwhelming force of opinion in favor of these statements respecting ethyl bromide: That under its influence patients slumber easily and wake quickly, that the effects are agreeable, that the circulation is not markedly affected in any way, and, lastly, that excitement is, at least, not more common and not more troublesome than in the case of gas.

¹ Sternfeld suggests the following simple test: "If a drop of ethyl bromide be let fall in a solution of potassium iodide 3 cm. deep, it should reach the bottom without being colored violet."

APPENDICITIS.

For some time past the journals have been crowded with articles upon appendicitis. Upon reading many of these it becomes evident that wide differences of opinion exist in regard to matters of vital moment in the treatment of this affection.

What should be the period of medical treatment? What should be done as to the use of opium? What as to the employment of salines? Should ice-bags be used locally, or are hot fomentations to be preferred? When does the case become purely surgical? Around these points the contest rages, and in regard to them there is much contention and disputation.

Under the designation of appendicitis are included many conditions of which inflammation of the appendix is almost invariably the first factor—conditions formerly spoken of as typhlitis, peri-typhlitis, para-typhlitis, etc. Primary inflammation of the cecum can occur, inflammation without antecedent appendicitis, but it is of infinite rarity.

KEEN describes five forms of appendicitis:

1. A mild inflammation, without pus-formation, which terminates in resolution.
2. Perforative cases, general peritonitis following the perforation. We here observe two varieties:
 - a. A fulminant form in which very early perforation occurs.
 - b. Mild symptoms for a considerable time, and suddenly a perforation.
3. Perforative cases, plastic peritonitis preceding the perforation, which plastic matter, for a time at least, shuts off pus from the peritoneal cavity.
4. Cases of slow abscess-formation, taking many weeks or even months to thoroughly develop. PARK tells us that this form "may assume tubercular characteristics."
5. Recurrent cases.

Cases of catarrhal inflammation of the mucous membrane of the appendix may be mild and get well with almost no trouble, and this is the history of a great majority of them, but they may become severe and end in most formidable disorders.

The position of the appendix renders it constantly liable to have forced into it some of the contents of the gut. This may get out without causing trouble, may induce a little pain and spasm, and then escape, or may be caught and incite inflammation.

The intestinal matter may contain hardened fecal

masses or hard foreign bodies, but even if fluid, on entry into the appendix, hard agglutinations form during a prolonged retention by the absorption of the liquid elements.

In a mild catarrhal inflammation, swelling of the neck of the appendix will diminish and spasm will abate, and the cul-de-sac will empty itself, and the patient be cured. But the case may, unfortunately, progress in the wrong direction. Hard masses or pus may fill the appendix; muscular wall and peritoneal covering may inflame by contiguity of tissue, or the growth and extension of microorganisms; ulceration may occur, microbes or pressure causing local gangrene; abscess can form; gangrene can appear because of extensive infection, or of the pressure of the cecum on the distended appendix; death may end the drama by shock or septic peritonitis. Pus may form with marvellous rapidity. We have seen two pints produced by the fifth day of the disease.

Perforation is the usual cause of death. This condition was shown by MATTERSTOCK to exist in 132 out of 146 fatal cases.

Gangrene may be of early origin. WYETH operated fifty-one hours after the onset of an attack, and found gangrene. It is the worst of all complications, and may kill in a few hours, even before rupture. It induces widely diffused septic peritonitis and great shock.

How should appendicitis be treated? We should remember that even the apparently simplest cases may at any moment become intensely perilous; hence, in each and every case we must have everything ready for an operation at a moment's notice. In a mild case, we will wait awhile and treat it medically. Some use opium; others condemn it on the ground that it masks important symptoms, and so gives a false sense of security in the face of imminent danger. Some tell us to give salines; others assert that salines favor perforation. The truth seems to be between these two assertions. The bowels should be emptied in the beginning of the attack, as this relieves the cecum of pressure, drains serum from the inflamed area, and may allow the appendix to empty itself. But salines should not be continued; they should only be given in the acute stage. To continue them would favor perforation and prevent adhesions. Our object is to prevent perforation, and favor plastic peritonitis. Hence, as soon as the bowels are well emptied, it is advisable to use opium. This arrests vermicular motion,

allays pain, puts the parts at rest, and favors adhesion. Ice-bags externally do not favor adhesion, but warmth does; hence warm fomentations and turpentine are advisable.

When shall we operate? It is well not to hesitate too long, thus waiting until perforation occurs. In grave cases the advice holds, Operate at once; but in ordinary cases wait for a time. We may have to operate in from thirty-six to forty-eight hours, or even sooner. If the peritonitis at the end of forty-eight hours has distinctly advanced; if marked tenderness and some tumefaction are noted at McBurney's point; if high temperature persists, then operation must be prompt. If shock occurs, or sepsis becomes manifest, one cannot operate too early.

Recurrent appendicitis indicates operation, during the attack if indications exist, but at least after the cessation of the symptoms. Some condition probably exists in these cases, such as distention of the mouth of the appendix, which renders the occurrence of future seizures highly probable, and any one of them may kill.

The tendency of the best surgical thought in regard to appendicitis is toward an enlightened radicalism. One can often do more harm by not interfering surgically than by interfering. If we are uncertain about the existence of pus, and if the patient is in good condition, and not getting worse, it is wise to give him the benefit of the doubt and wait. If one is uncertain, and the condition of the patient is growing worse, an exploratory incision is certainly indicated. Each case is to some extent a law unto itself, and we cannot formulate a definite system of rules for all cases. Exceptions strew the path of almost every peremptory assertion, excepting it may be the following: Do not hesitate, if the symptoms are growing worse, to open and explore, and always operate if perforation, gangrene, or pusformation is suspected. "The first duty of a physician in these cases is to call in a surgeon."

THE METRIC SYSTEM.

OUR attention is again called to this subject by a circular of "The New Decimal Association, established to promote the adoption of the decimal system of weights, measures, and coinage in the United Kingdom." Among the members of its general committee are fourteen peers and twenty-seven commoners. More significant, however, is the representation of "trades councils" (officials

of labor unions), accountants, bankers, manufacturers, and foreign traders, the last testifying that the use of the old units of measure is injuring the British export trade, as the metric system has been adopted by no less than thirty-nine foreign countries, with a population of four hundred and twenty millions.

The apathy of the American people in regard to decimal reform is easily explained, when we consider that the arithmetical problems of the great majority of persons are almost entirely limited to money matters, in which we already enjoy the advantages of a scale of tens. But, in physiology, chemistry, pathology, and in other sciences, and in prescription-writing, medical men are frequently called upon to calculate in terms of length, weight, and volume, and are thus particularly interested in any proposed improvement in our system of denominate numbers.

Many and diverse are the arguments against the metric system. Conservatism appears in various guises, now warning us that mistakes of the druggist or physician may cause loss of life, or again lamenting that metric prescriptions will not fit four-ounce bottles. Even an appeal to race prejudice is made against the French, who originated the system. The almost inevitable errors in the survey of the terrestrial quadrant are exaggerated, and one writer would delay to infinity the adoption of this system by having "the mean of all possible meridians taken as a standard." It is said that the metric units are inconvenient in size—a statement betokening ignorance of or indifference to truth.

The conservatism of mere inertia is a small obstacle to the progressiveness of a profession that has made sweeping changes in therapeutics, and has revolutionized surgery in the lifetime of its youngest member. It is inconsistent, too, for a profession that stands ready to adopt "any old woman's remedy, or to borrow therapeutic agents from sectarian schools of medicine, from charlatans and from savage tribes, to condemn a system of weights and measures on account of its French origin. We must confess to a prejudice in favor of a system of denominate numbers founded on a measurement of our planet. We can scarcely imagine any other natural and tangible basis appropriate for worldwide use, unless it be the length of a standard pendulum beating in seconds, and this is almost the same as the meter. Probably not one in a hundred of our readers can recite the tables of denominate

numbers that we learned in school, yet we venture to say that a few hours' study of the metric system will permanently impress the corresponding tables on the mind of any intelligent person.

These, however, are theoretical arguments. How are they justified by practical results? We have already said that half the civilized and semi-civilized population of the world is using the new system. Pathologists are measuring animal cells and bacteria in micromillimeters instead of many-figured fractions of an inch, and the millimeter is growing in favor with histologists. Pelvimetry and the measurement of fetal diameters—in short, the quantitative part of the mechanism of labor—are expressed almost universally in centimeters. Chemists were quick to recognize the value of a simple scientific relationship between measurements of volume and units of weight, such as exists between the gram and cubic centimeter, and such as exists nowhere in the older systems. Even the translation of the centesimal results of quantitative analyses for clinical purposes into grains and ounces is rapidly becoming a thing of the past. Urine and other secretions are estimated in cubic centimeters (milliliters), urea, sugar, etc., in grams. The adoption of the metric system in the United States Pharmacopeia of 1880 may have been due to the enthusiasm awakened by a comparative novelty, but its exclusive use in the edition of 1890 is the result of a more gradual and substantial appreciation of its merits. Vulgar fractions of a grain are awkward expressions of dose, and between the conflicting tendencies to divide the grain into fifths, tenths, etc., on the one hand, and by powers of two on the other, manufacturing pharmacists are compromising on amounts corresponding to multiples and simple fractions of the milligram. Those physicians, moreover, who have broken with habit, and have used the gram, centigram, and milligram in prescribing, and the cubic centimeter and liter as liquid measures, are almost unanimous in the opinion that a return to the apothecary's system would be as much of a hardship as to go back to arithmetical computations in pounds, shillings, and pence.

CORRESPONDENCE.

THE DIAGNOSIS OF BOVINE TUBERCULOSIS.

To the Editor of THE MEDICAL NEWS,

SIR: THE MEDICAL NEWS of April 9th contained a letter from me, in which the value of tuberculin in the

diagnosis of tuberculosis in cattle was considered, and reference was made to the slaughter of a number of tuberculous cows belonging to Mr. J. E. Gillingham.

At the time that the letter was written but a part of the cows that had reacted after the injection of tuberculin had been slaughtered, so that the results of the examination were incomplete.

It will be remembered that out of a total of seventy-nine animals tested with tuberculin, thirty reacted in a way that was taken to indicate tuberculosis; all of these, together with a few calves from diseased cows, have now been slaughtered. All of the animals that reacted proved, upon the post-mortem examination, to be tuberculous.

It does not seem necessary to give tables showing the reactions and results of the post-mortem examinations in each case, as two sample reactions were printed in my last letter. The elevation of temperature that follows the injection of tuberculin in a tuberculous animal comes on in from nine to sixteen hours, and reaches a point from one to six degrees above the normal. In some cases the temperature drops back to normal within a few hours, but in others the fever remains for several days. The second injection is always followed by a milder reaction than the first, even if a period of several days or a month intervenes.

It was found that the degree of reaction was not in proportion to the extent of the lesions, for animals in which the lesions were slight sometimes displayed marked reactions, while the reaction in animals with widespread tuberculosis was sometimes slight. We may thus say that tuberculin furnishes a poor index to the severity of a case of tuberculosis; by its use we can simply determine the presence of the disease. For this reason tuberculin does not entirely supplant physical examination in the diagnosis of tuberculosis of cattle, but both methods should be used together, and of the two the former is by far the more valuable and important. It is safe to say that by the most careful physical examination not 25 per cent. of the cases of tuberculosis among cattle can be detected, while by the use of tuberculin and physical examination together, all of them can be discovered.

In a recent physical examination of the cattle of the State Agricultural Experiment-Station herd, five cows were selected as being probable subjects of tuberculosis, and were ordered to be killed. My examination with tuberculin revealed but two animals that reacted, and only one of these had been marked as tuberculous. The two methods of examination thus coincided in but one case. The slaughter of the five cows in question showed but two cases of tuberculosis, the two which had reacted.

It is well known that the tuberculosis of cattle is contagious, and sometimes spreads rapidly, until an entire herd is diseased, and that the only way to check the progress of the disease is to destroy or remove all affected animals, enforce good hygiene, and thoroughly disinfect the stable. Heretofore it has been impossible to carry out the first of these measures, on account of the great difficulty in diagnosing bovine tuberculosis in its early stages, and most of the attempts at eradication have been failures, or have occupied a number of years.

It is easy, then, to appreciate the great value of tuberculin to the veterinarian, and the good results that have followed its use in this country are exceedingly gratify-

ing. We have every reason to think that by its use herds can be cleared of tuberculosis, and in this way a great many cases in the human family can be prevented.

Very respectfully yours,

LEONARD PEARSON, B.S., M.D.

VETERINARY DEPARTMENT,
UNIVERSITY OF PENNSYLVANIA.

A KEELEY FALSITY EXPOSED.

To the Editor of THE MEDICAL NEWS,

SIR: Among the claims made by the venders of the Keeley nostrum is one that it has been indorsed by the Government, and is used in the Soldiers' and Sailors' Homes. This statement has been made repeatedly in a leading New York daily. It is misleading and mischievous, because the assertion of such high sanction might beguile some into a trustful—but soon proved trustless—confidence.

I have been asked as to the truth of this claim by some who have honored me with their cases, after a loss of time and treasure at the Keeley Institutes, and thinking it incredible that it should receive such prominent support, I procured proofs of its falsity, which are herewith presented:

SURGEON-GENERAL'S OFFICE,
WASHINGTON, July 20, 1892.

DR. J. B. MATTISON: The Surgeon-General instructs me to acknowledge the receipt of your letter of the 19th inst., and in reply to say that the Medical Department of the army has never had anything to do with Mr. Keeley or the people having in charge the so-called Keeley cure.

Very respectfully,

Your obedient servant,

CHARLES R. GREENLEAF,
Lieut.-Col. and Assist. Med. Purveyor, U. S. A.

NAVY DEPARTMENT,
BUREAU OF MEDICINE AND SURGERY,
WASHINGTON, November 25, 1892.

DR. J. B. MATTISON: You are respectfully informed that there are no Sailors' Homes under the cognizance of this Bureau, and that, to the best of its knowledge and belief, the Keeley cure is not, and has not been, in use at the U. S. Naval Home, Philadelphia, the only institution in the navy for the care of aged seamen.

Very respectfully,

J. MILLS BROWN,
Surgeon-General U. S. N.

SOLDIERS' AND SAILORS' HOME,
BATH, N. Y., September 14, 1892.

DEAR DOCTOR: I would say we have never used any of "Keeley Cure" in this Home.

Yours cordially,

T. O. BURLISON,
Surgeon.

SOLDIERS' AND SAILORS' HOME,
ERIE, PA., November 18, 1892.

DEAR DOCTOR: I would say that none of the Keeley nostrum has been adopted or used in this Home.

Very respectfully,

S. T. CHAPIN,
Surgeon.

SOLDIERS' HOSPITAL OF CONNECTICUT,
NOROTON HEIGHTS, October 11, 1892.

DEAR SIR: As regards this Home, no orders have been given to adopt the Keeley treatment. I regard it as one of the modern shrewd devices for fleecing the credulous and gullible public.

Very truly yours,

W. G. BROWNSON,
Surgeon.

NEW JERSEY HOME FOR DISABLED SOLDIERS,
KEARNEY, N. J., September 18, 1892.

DEAR DOCTOR: This Home has not adopted the Keeley treatment.

Very sincerely yours,

ARCHIBALD MERCER,
Surgeon.

Verbum sap.

Respectfully,

J. B. MATTISON.

BROOKLYN, N. Y.

HYDRIATRIC OR HYDRIATIC?

To the Editor of THE MEDICAL NEWS,

SIR: THE MEDICAL NEWS has repeatedly corrected the word hydriatic, which I use, to hydriatric. I wish to state that not only is hydriatric not a false word, because its formation is correct, and because *iatrinos* even is used by Greek writers, not to speak about the custom amongst German writers, but also because hydriatric expresses exactly what I wish to say, while hydriatic does not. Hydriatic method means a method healing with water—hydriatric a method of the water-healing art.

Respectfully,

C. SIHLER.

CLEVELAND, OHIO, November 26, 1892.

[THE NEWS simply followed the command of the Sydenham Society's Lexicon, that of Foster, Billings, and others, but frankly confesses that it is not at all certain but that Dr. Sihler is substantially correct in his contention.—EDITOR THE MEDICAL NEWS.]

NEWS ITEMS.

Revision of the Code.—At the session of the American Medical Association, held in Detroit, Michigan, June 7, 1892, a committee to consider and advise concerning the revision of the Code of Ethics and the Constitution and By-laws of the Association was appointed. The committee desires that every practitioner should study anew the laws in question, and that each would then inform the chairman of the committee, Dr. Henry D. Holton, Brattleboro, Vt., whether he is in favor of any change, and, if so, exactly what change. In this connection we would recall attention to the editorial article in THE MEDICAL NEWS, Sept. 17, 1892.

Nostrums at the World's Fair.—Rule 15 of the pamphlet on Classification and Rules issued by the World's Columbian Exposition reads as follows: "Articles that are in any way dangerous or offensive, also patent medicines, nostrums, and empirical preparations whose ingredients are concealed, will not be admitted to the Exposition."

Dr. John Ridlon has been appointed Professor of Orthopedic Surgery in the Post-Graduate Medical School of Chicago.

COMMUNICATIONS are invited from all parts of the world. Original articles contributed exclusively to THE MEDICAL NEWS will upon publication be liberally paid for, or 250 reprints will be furnished instead of payment, provided that the request for reprints be noted by the author at the top of the manuscript. When necessary to elucidate the text, illustrations will be provided without cost to the author.

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